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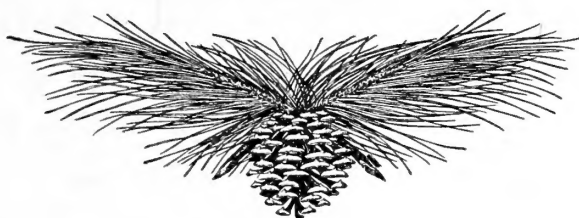
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# FOREST WORKER



May, 1929

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# FOREST WORKER

Washington, D. C.

MAY, 1929

Vol. 5, No. 3

## State Forestry

### Two New York Forestry Laws Approved Unanimously

By PAUL D. KELLETER, New York State College of Forestry

Unanimous action by the legislature, promptly followed with approval by Governor Franklin D. Roosevelt, gives a unique distinction to two new forestry laws of the State of New York. The measures have emerged triumphantly from the vicissitudes of the legislative and political mill at Albany without a single voice having been raised against them either in committee hearings or on the floor of the senate or assembly.

Following recommendations made by the investigatory forestry commission organized in 1928, the State has taken steps to encourage the establishing of county forests and has adopted the policy of State acquisition of lands suitable for reforestation in counties other than the forest-preserve counties.

The county forest law authorizes each county to acquire land, reforest it, and maintain the forest growth for the protection of watersheds and to produce timber and other forest products, and provides that the State will make contributions for this purpose of not more than \$5,000 annually to each county. To obtain the subsidy from the State the individual county must certify its own appropriation for this purpose and its previous reforestation expenditures, and above all must submit in detail its proposed plan of forest management. The conservation commissioner will have the responsibility of deciding whether the plan submitted meets the purposes of the law. If he certifies that he is satisfied, payment will be made to the county. Trees will be furnished by the conservation department without charge except for transportation.

In the law authorizing the establishment of State forests in counties other than the forest-preserve counties, for administrative reasons the authorization is limited to projects covering continuous areas of at least 500 acres.

The Empire State has more than 5,000,000 acres of idle land. Since 1880 New York farm lands have been abandoned at the rate of about 250,000 acres annually. It is expected that these two laws (further details in regard to which were given in the March

number of the FOREST WORKER) will have a significant part in bringing about the rehabilitation of this vast area, which at present is shifting its burden of taxes to other lands ill suited to bear the additional load.

The forestry commission has been continued another year. The expectation is that it will next take up the question of taxation of forest lands. A forest tax law was enacted in New York three years ago, but there has not been any general move by land-owners to bring their land under its provisions. Study is needed to ascertain the reason for this law's lack of popularity.

### Increased Appropriation for South Carolina Forestry

An appropriation of \$12,500 has been made by the South Carolina Legislature for State forestry work in the calendar year 1929. The appropriation made for this work in the preceding year was \$4,000. State Forester Staley expects that funds added by private cooperators to State and Federal funds for forest fire protection work in the State in the year beginning July 1, 1929, will bring the total available for that purpose to a little more than \$50,000.

### West Virginia Game, Fish, and Forestry Commission

Under the terms of a law effective July 1, 1929, the West Virginia Game and Fish Commission will become the West Virginia Game, Fish, and Forestry Commission. The law provides for the appointment by the commission of a chief forester, who must be a graduate of a reputable college or university with technical forestry training and practical experience in forestry. The forestry division, headed by the chief forester, will be on a parity with the game and fish division, headed by the chief game protector. Authority is given to the commission to purchase land suitable for State forests and forest parks. Other provisions of the law lay new restrictions on hunting in the State, under one of which deer are to be protected for the next five years in Mingo, Marion, Marshal, and Mercer Counties, and give the commission discretionary powers to modify the dates for the opening and closing of hunting seasons and to change bag limits.

## New Idaho Forestry Legislation

Under the new reforestation law of Idaho cut-over or burned-over forest lands that have no commercial timber on them, that are chiefly valuable for producing commercial forest crops, and that are set aside by the owners for reforestation, may be assessed for taxation purposes at \$1 an acre. When the timber crops are harvested, a yield tax of 12½ per cent of the stumpage value is to be assessed. Administration of the law is intrusted to the State cooperative board of forestry. If lands brought under the provisions of the law are found to be usable for grazing or other purposes not detrimental to reforestation, the additional value is to be assessed for taxation by the State board of equalization.

Forest-protection districts already established in the State, or hereafter to be established, under the Idaho forestry act of 1925, are designated under this law as "reforestation districts" within which the provisions of the law apply. Persons wishing to have their lands designated as "reforestation lands" are to petition the State cooperative board of forestry for such designation, affirming that they believe the lands chiefly valuable for growing forests and agreeing, among other things, that they will comply with the board's rules and regulations for the care and development of commercial forests and pay their proper share of the cost of fire protection. The board is to grant or refuse the petitions on the basis of the statements made in them and of evidence brought out at public hearings.

The designation of lands as reforestation lands may be canceled by the board if it is found that the owner is not complying in good faith with the provisions of the act, or if it is found that commercial timber was present on the lands at the time of the owner's petition. When a cancellation is made, any difference between the taxes that have been paid and those that should have been paid under the general tax laws will be collectible, and in cases involving the presence of commercial timber 10 per cent interest will be due on the difference. If through changing conditions lands designated as reforestation lands become more valuable for other purposes than for reforestation they may be excluded, "provided that the owner thereof shall be required as a condition precedent to the entry of said order of exclusion" to pay any difference between the tax paid on the lands and timber under the provisions of this act and the tax that would have been paid under the general laws of the State.

Owners of reforestation lands are forbidden to permit grazing on them or use them for any other purpose except under rules and regulations adopted by the board.

Thirty days' notice of intention is required before any timber is cut on reforestation lands for other than domestic purposes, and before the cutting the owner must give bond that the yield tax will be promptly paid when due. In January of each year owners of

reforestation lands will be required to report to the board and to the county assessor the amount of any forest crop cut during the preceding calendar year. The yield tax will then become payable to the county treasurer on the basis of full current stumpage value at the time of cutting as determined by the board. Forest materials cut for the domestic use of the owner of the lands will be exempt from taxation. The yield tax will become delinquent if not paid on or before the 1st day of June following. It will become a lien against lands, the forest materials cut from them, and any other real or personal property of the owner within the county. The lien may be enforced in the same manner as other delinquent taxes, and collected under the general tax laws of the State.

Yield taxes will be placed in the general fund of the county.

Lands covered with commercial timber at the time of the passage of the act will be eligible for designation as reforestation lands when the commercial timber has been cut and removed only if the operation is carried out in compliance with the laws of the State, and if young and immature timber is left as prescribed by the board and is given the greatest practicable protection from logging injury.

The designation of lands as reforestation lands is not to affect the right of the public to camp, hunt, and fish on them.

The passage of this act, the verified petition of the owner, and the making and filing of the designating order by the State cooperative board of forestry will be held to constitute a contract between the State of Idaho and the owner, running for a period of 50 years. No change in or repeal of the act will apply to land that has been designated as reforestation land except as the board and the owner may agree. At the expiration of 50 years the contract may be renewed by mutual consent of the owner and the board. If the contract is not renewed, the merchantable timber on the lands is to be estimated by a cruiser agreed upon by the board and the owner, or, if they fail to agree, by a committee of three cruisers of whom one is to be selected by the landowner, one by the board, and a third by these two. Cruising expenses will be borne equally by the owner and the State. The yield tax will then become due as if the timber had been cut.

Any purchaser of reforestation land, other than the State or Federal Government, will take the land subject to all the provision of the act.

An act amending the Idaho forestry law of 1925 establishes the injunction as an additional remedy for violation of the law's requirements as to slash disposal. It makes violation of any of the provisions of this law in regard to slash disposal or the clearing of rights of way and clearing around logging donkeys, camps, and buildings on any legal subdivision a separate offense punishable by fine, and reduces the minimum fine for such an offense (formerly \$100) to \$50. It also makes violation of any of the provisions of the law in

regard to setting fires during the closed season punishable by a fine of not more than \$1,000 or by imprisonment in the county jail for not more than 6 months or by both such fine and imprisonment.

## Wisconsin Interim Committee Report on Forestry and Public Lands

In the report of the interim committee on forestry and public lands to the Wisconsin Legislature, issued in March, a comprehensive program is proposed for handling the forest lands in the State. This program includes provision for Federal, State, county, and community forests, for encouragement of forestry on private lands, for forest fire protection, and for forest research.

The unique feature of this program is the importance it gives to county forests. In Wisconsin tax-delinquent lands revert to the counties; and for this reason the committee sees the county as the chief governmental unit around which the program of public forestry in the State must be built. It is therefore recommended that the counties be encouraged to take title to delinquent forest lands and that they be allowed to enter such lands under the forest crop law of the State without paying the 10 cents acreage tax assessed against private owners. It is also recommended that the counties be empowered to control development by zoning, setting aside for forest and recreation purposes lands on which settlement is sparse, tax delinquency heavy, and abandoned farms numerous. This zoning authority would carry with it the right to bring isolated settlers into agricultural zones by exchanging lands with them. In order that the county forests may have the best technical care the committee recommends the adoption of a plan under which the conservation commission would cooperate with county authorities in selecting land for development as county forests and in improving and caring for such land.

The recommended program for county forests grows out of the tax-delinquency situation, which is particularly serious in northern Wisconsin. In the 17 northern counties 2,500,000 acres were tax delinquent in 1927. As one method of checking the tendency of tax delinquency to feed upon itself the committee recommends that tax delinquent lands be tied up for 50 years by entry under the forest crop law.

In order to encourage selective logging the committee recommends the repeal of the section of the forest crop law that prohibits entry of lands bearing commercial timber. Several other amendments to the forest crop law are proposed, the chief of which would permit counties and other local government units to enter forests under the law with exemption from payment of the owner's acreage tax of 10 cents but subject to the yield tax of 10 per cent,

The committee recommends that encouragement be given to private forestry, in addition to that provided in the forest crop law, by extending the State's nursery facilities and by amending the State income tax laws so as to permit private owners who are engaged in planting to capitalize their expenditures on planting or to charge them to operating expense each year.

In view of the fact that there are in Wisconsin about 18,000,000 acres of land requiring forest management, the committee recommends that the limit of Federal acquisition for national forest purposes in the State be increased from 500,000 acres to 750,000 acres. It recommends also that efforts be made to block up State forest lands by exchange, sale, and purchase, and that strips of timberland along highways be acquired by the State.

As fundamental to the success of all other plans for handling the forestry problem in the State, the committee recommends the extension of the forest protection system and the immediate appointment of a State fire warden under the direction of the State forester.

In preparing to make its report the committee studied the situation not only in Wisconsin but in the neighboring States of Michigan and Minnesota, and also visited Pennsylvania, Massachusetts, and New York to observe the methods by which those States are handling their forestry problems.

Estimates submitted by the committee indicate that the total stand of merchantable timber in Wisconsin amounts to about twelve and one-half billion board feet. Without regard for possible growth in the meantime it is calculated that this timber supply is insufficient to last the wood-using industries of the State longer than about 12 years.

## Action on New Hampshire Taxation Bills Deferred

Action on taxation bills introduced in the New Hampshire Legislature, including bills proposing that a tax assessed on timber at the time of cutting be substituted for annual taxes on growing timber and that the towns be reimbursed by the State for resulting loss in revenue, has been deferred until the next session of the legislature. At the request of Governor Tobey the senate adopted a resolution referring to the next legislature the tax-revision program that has been drawn up by a recess commission of the legislature created for that purpose. The object in deferring action is to obtain in advance an opinion of the State supreme court as to the constitutionality of the bills included in this program, and such an opinion is required of the court under the terms of the senate resolution. The governor has proposed that in case of an adverse decision by the court a constitutional convention be called in 1930. The next session of the legislature will take place in 1931.



## Louisiana Hardwood Lands Offer Exceptional Opportunities for Timber Growing

By G. H. LENTZ, New York State College of Forestry

In the hardwood bottom lands of Louisiana moist conditions have not prevented severe injury to timber by fire. After spending most of last year in the Louisiana hardwood forests as a special investigator for the State division of forestry I am uncertain, in fact, as to whether the final loss from fire has not been greater in the hardwood stands than in the pine woods of the State. In the warm, humid conditions prevailing in the Louisiana bottom lands hardwoods injured by fire are readily attacked by fungi, which cause butt rot. In the bottom lands north of the Red River from 80 to 90 per cent of the hardwood stands were burned over in 1916 or 1924-25, or in both those periods. Evidences of fire as far back as 1860 or thereabouts were noted. In the parishes south of the Red River and those east of the Mississippi evidence of fire injury is present but is less pronounced. Detailed study on a logging operation in a red-gum flat where fires had occurred in 1916 and again in 1924 showed that the loss in merchantable timber due to fire and decay amounted to about 15 per cent of the stand.

During 1928 about 80 mills with an individual daily output of 30,000 board feet or more were operating in the hardwood region of Louisiana. Visits to 60 of the mills elicited the information that 5 of these had 10 to 15 years' supply of timber, 6 had 5 to 10 years' supply, 32 had 1 to 5 years' supply, and 17 had no timberland but operated on logs bought in the vicinity. (A survey by the Hardwood Manufacturers Institute showed that 83 hardwood mills with an estimated total annual production of 908,000,000 board feet were in operation in Louisiana on January 1, 1929; and that in the past five years 37 hardwood mills cut out and 21 new ones came into production in the State.)

Louisiana contains a very large percentage of the hardwood supply remaining in the United States. The hardwood lands are the wide river bottoms such as those of the Mississippi, Atchafalaya, Ouachita, and Red, the narrower bottoms of the smaller streams and rivers flowing through pine lands, and the uplands of the southeastern part of the State. The soils are exceedingly fertile, the growing season exceptionally long, and weather conditions favorable to tree growth. Not only is Louisiana now the leading producer of hardwoods in the United States, but its hardwood region has perhaps a larger capacity for the production of wood, under forestry management, than any other forest region in the United States.

Much of this region is potential farm land, but at present there is no general demand in Louisiana for cut-over hardwood lands for agricultural purposes. As a result of the adoption of more intensive farming methods the area under cultivation has in fact decreased markedly in the last 10 years. Large areas, also,

remain uncultivated owing to lack of drainage, but would not need to be drained in order to produce timber.

In the pine region of Louisiana clear cutting followed by fire has in many cases resulted in such devastation that a new growth of timber trees can be obtained only by artificial reforestation; in the hardwood bottom lands no such devastated areas occur. Hardwood reproduction comes back even on areas that have received the most severe treatment. Under present conditions, however, the growth of a second crop is a long, tedious process and the chance of a good stand of timber being produced in this way is very poor. Cut-over areas are often left with little or no growing stock or with inferior species largely monopolizing the site; or, worse, only the best trees of the most desirable species are cut, leaving a mature stand consisting largely of malformed specimens and undesirable species that hinders development of a valuable young stand.

Under present logging practice many small trees are cut just as they are beginning to put on clear growth. If such trees were left for a later cut, with their allowance of light and food material increased by the removal of competition they would rapidly increase in value. In 10 to 20 years they might easily be worth five to ten times as much as when the earlier cutting was made.

A few farsighted Louisiana timberland owners have realized that it is unprofitable to cut their small trees and are now practicing selective logging. Only the mature trees are taken, trees of small diameter being left to be cut when they are considerably larger and contain a greater proportion of the higher grades of lumber.

## Oklahoma State Park Association

A State park association has been formed in Oklahoma with Thomas H. Doyle, for a long time presiding judge of the Criminal Court of Appeals of Oklahoma, as chairman, and Charles C. Brill, sports editor of the Daily Oklahoman, as secretary. The board of directors includes the chairman of the fish and game commission, the State forester, the director of the geological survey, the president of the Oklahoma Forestry Association, and the president of the Oklahoma Automobile Association. A bill providing for the creation of a State park commission was drawn up by the association and introduced in the legislature, where it was passed by the house but was rejected by the senate on the ground that it would lead to expenditures which the State can not afford at present. It is planned to have a similar bill introduced at the special session of the legislature soon to be held.

The Maryland Legislature has made \$50,000 available for the purchase of land for State forests in the next two years.



## California Counties Cooperate with the State in Fire Protection

A strong reinforcement of the agencies working to prevent fires in California is hailed by State Forester Pratt as he announces that Shasta County has entered into a cooperative agreement with the State division of forestry. The county board of supervisors has paid \$2,500 as the county's contribution to fire-prevention funds for the year beginning July 1, 1929. From this amount will be paid the traveling expenses of a ranger, and the salaries of temporary additional patrolmen if these are needed. The State agrees to maintain a ranger in the county throughout the year and to pay all fire-prevention costs in excess of \$2,500. In the decision of Shasta County to take part in fire-prevention work Mr. Pratt sees a desire to assist in protecting not only the important timber, grazing, and agricultural resources of the county but the brush-covered and forested watersheds contained in the county upon which the entire Sacramento Valley must largely depend for its summer water supply.

Madera County has renewed its agreement with the State for fire-prevention activities, contributing \$1,500 toward the year's work. A ranger will be on duty in the county seven months of the year and a lookout will be maintained on Red Top Mountain, the State assuming all expenses in excess of \$1,500.

## North Carolina Improves Its Fire Record

In reporting that 1,169 forest fires occurred on the protected area in North Carolina during 1928, the State division of forestry charges 266 of these fires to brush burning, 194 to incendiarism, and 175 to smokers. The other fires are classified according to cause as follows: 131, hunters, fishermen, and campers; 74, railroads; 43, lumbering; 5, lightning; 127, miscellaneous; and 154, unknown.

Of 89 prosecutions conducted during the year against persons charged with responsibility for fires, 62 resulted within the year in convictions. In these cases fines amounting to \$699 were imposed, and \$590 was assessed against convicted persons as court costs. Persons responsible for fires paid suppression costs totaling \$1,309.

Voluntary assistance in suppressing fires was given during the year by 2,865 individuals.

Forestry officials of the State express satisfaction in the fact that in 1928, although the protected area was larger by more than 1,000,000 acres than it had been in 1927, the area burned over was only 80,611 as compared with 238,845 in the preceding year. The area burned over by a single fire averaged 69 acres—the first time in the record period that it was kept below 100 acres.

## Forest Planting on Private Land in Texas

The era of forest planting on private land in Texas has dawned, the Texas Forest Service reports, with plantings made during the past winter on cut-over lands belonging to two lumber companies and on five farms. About 50,000 long-leaf pine seedlings went to the planting by the Angelina County Lumber Co. of 40 acres of land near Yancy, formerly occupied by an especially fine stand of long-leaf timber, and the Southern Pine Lumber Co.'s planting of about 10 acres near Pineland, in Sabine County. The stock was supplied from the State nurseries at \$1.50 per 1,000. Members of the State forest service supervised the planting work until the crews became familiar with their method. The trees were planted in rows 8 feet apart, 6 feet apart within the rows. Both these plantations have been inclosed with hog-proof fence and surrounded with fire lines made by plowing two furrows 50 feet apart and burning the grass between.

The five plantings made on idle farm land called for 6,700 State-grown pine seedlings. H. W. Hawker, manager of Leone Plantation, at Teague, added to the 3,500 pines supplied to him from the State nursery some 5,000 short-leaf pines grown in a nursery of his own.

Three Four-H forestry club boys of Rusk County have planted a total of 1,700 long-leaf pines on their parents' farms. These boys are planning to raise Irish and sweet potatoes between the rows of trees, which are 6 feet apart.

The area of cut-over land in Texas that is without seed trees and requires reforestation by planting is estimated by the State forest service at more than 4,000,000 acres.

## Pennsylvania Municipalities Plant Nearly Two Million Trees from State Nurseries

In Pennsylvania 1,991,775 of the trees distributed from the State forest nurseries in the 13-year period 1916-1928 have been planted on municipal land. Among 15 cities that have shared in the distribution Pittsburgh has used the largest number of the trees, 349,050. Reading follows with 223,800, Altoona with 161,000, and Philadelphia with 133,500. Boyertown has taken the lead among 48 boroughs by planting 130,000 of the trees and is followed by Fleetwood with 119,350, Broughton with 89,000, and East Stroudsburg with 65,000. Of 51 municipalities that began ordering State-raised trees before 1928 the majority have come back for a second helping, and many have "asked for more" two or three times. The city of Du Bois, beginning in 1917, has made nine successive annual plantings.

## Recent Vermont Forestry Legislation

Under a recent amendment of the Vermont forest nursery law the State commissioner of forestry may sell nursery stock for as little as half the cost of production, when the stock is to be used in reforesting lands owned by municipal corporations, schools, churches, and colleges. For stock that is to be used in reforesting private lands he will continue to charge the full cost of production.

Another piece of legislation recently approved by Governor Weeks authorizes the Vermont commissioner of forestry to acquire, by gift or purchase, lands to be held and administered as State forest parks. A highway appropriation of \$2,000 has been made for the building and rebuilding of a roadway on the Mount Philo State Forest.

The annual appropriation for the Vermont forest service for the next two years is the same as for the past two: \$24,500 as a general appropriation and \$8,000 for the purchase and reforestation of State forests, together with all receipts of the service.

## Vermont Enlarges Mount Mansfield State Forest

The State of Vermont has recently purchased 1,238 acres of forest land on the west slope of Mount Mansfield, the highest mountain in the State. With this addition the Mount Mansfield State Forest has an area of 5,084 acres including practically all of the east and west slopes of the mountain. A narrow strip

along the ridge is the property of the University of Vermont. On the State forest are several hundred thousand board feet of old-growth hardwoods, chiefly yellow birch and maple. Much of this timber is mature. In cutting it the Vermont Forest Service plans to protect the brooks and scenic attractions of the region. Little or no timber is to be cut along the trail leading from the "Halfway House" to the summit.

Vermont now has 18 State forests with a total area of about 34,100 acres.

Twenty members of the Elkins, W. Va., Y. M. C. A. found themselves willing to be enlisted in a forest fire fighting crew when the suggestion was made this spring by District Forester H. Y. Forsyth. Carrol Talbott, president of the association, heads the crew. The West Virginia State forestry organization has supplied the crew with forest fire-fighting tools and with a tool box. The box, labeled in black letters on red, occupies a conspicuous position on the lawn of the association, on the main street of Elkins. A special signal with the city's fire alarm has been arranged for calling the crew together.

This spring, as in 1928, New Hampshire towns holding title to forest land that needed to be planted could obtain planting stock free of charge from the State forestry department. Last year 32 towns availed themselves of this privilege, receiving 250,000 trees.

# Education and Extension

## Two Pennsylvania Schools Consolidated      New York Ranger School Offers Full Year of Training

Announcement has been made by Charles E. Dorworth, secretary of the Pennsylvania Department of Forests and Waters, of the consolidation of the State forest school at Mont Alto with the forestry department of the Pennsylvania State College. The union will be effective June 15 of this year, when students of the two schools will join for summer camp work.

The school at Mont Alto was established in 1903, and the forestry department of the State college in 1906. Both have been maintained by the State. Secretary Dorworth points out that a single State agency in forestry educational work will be operated much more economically and will offer greater opportunities to both instructors and students. In directing degree courses in forestry the State college is to have the advice of members of the State forestry organization and will have the opportunity to make such use of the Mont Alto plant as may seem most helpful.

The new plans include special forest ranger courses and an enlargement of special forest research studies.

In 1930 the New York State Ranger School at Wana-kenah, N. Y., will extend its course to a full year. At present the course begins in March and ends in December. Under the new arrangement, which is made possible by the better housing of the school in the concrete building dedicated in 1928, the course will begin the first Wednesday in April and will end the second week in March of the following year, with a vacation of two weeks beginning in the latter part of June and one of equal length at the Christmas holidays. Dean Franklin Moon points out that in addition to the benefits of more thorough training this plan will give future graduates the advantage of leaving school at a season more favorable for finding employment. The extension of the course will add about \$100 to each student's expenses.

The ranger school has entered upon its 1929 session with a record enrollment of 63.

## Growth of Planted Trees in Michigan

In a spring message to owners of farms and estates in Michigan the State university quotes its results from 25 years' experiments in timber growing to show what growth may be expected of trees planted in the State. In the university's plantations northern white pine 27 years old has developed diameters as great as 7 inches. For this age group the average diameter, where trees are spaced as far as 6 or 8 feet apart, is 4.5 inches. Closely spaced northern white pine 22 years old shows an average height of 27.2 feet and an average breast-height diameter of 3.5 inches.

Scotch pine in 22 years has made an average height growth of 34.5 feet and has developed an average diameter of 4.5 inches. For this species, in a closely spaced plantation, the maximum diameter at 22 years is 9.7 inches. Red oak 16 years old is 18 feet high and 1.8 inches in diameter; yellow poplar 19 years old is 21.7 feet high and 2.1 inches in diameter; and black locust 14 years old is 28.6 feet high and 3.6 inches in diameter.

With the exception of the poplar, all these plantations are on rather poor gravelly soils of low agricultural value.

## California Extension Service Stages Traveling Fire-Control Show

A fire-protection show with many striking acts was sent on the road in California this spring by the Extension Service. Extension Engineer J. P. Fairbank and Extension Forester Woodbridge Metcalf were the performers, and the properties included fire-fighting equipment of many kinds. Traveling in a truck, the two men gave talks and demonstrations in school yards, according to advance arrangement by the local farm advisers. The extension forester's talk dealt briefly with the State's forest-fire record, the causes and results of forest fires, and the importance of forest, brush, and grass cover in protecting watersheds and checking floods. His explanation of what constitutes bad fire weather conditions was accompanied by the whirling of an anemometer on top of a tripod set up on the cab of the truck. He told how the State highway commission is making firebreaks along critical sections of road and urged a general clean-up of fire hazards in the community before the dry season.

The extension engineer discussed and illustrated the most important causes of fires in farm buildings.

Several of the common types of fire extinguishers were shown, and the methods of charging and using them were demonstrated with miniature glass models. Hand tools for fire fighting, from the lowly burlap sack to the elephant hoe and pressure back-firing torch, were shown and their use explained. Various hand-pump tanks and back-pack pumps and a small portable gasoline pumper were demonstrated. By means of two small rotary pumps driven by the engine of the truck, streams of water were thrown from nozzles of different sizes ranging from that of a spray gun using

about 6 gallons a minute, suitable for use on grass fires, to a  $\frac{5}{16}$ -inch nozzle throwing 30 gallons a minute.

Several small fires were then started and the school children had a chance to use the extinguishers and pumps in putting them out.

Meetings of this kind were held by the two specialists in eight counties during March, with a total attendance of 2,258. It was planned to continue the series through April.

## Estimates of Volume and Value Growth Stimulate Interest of Farmers

In demonstrating methods of timber estimating to Mississippi farmers, Extension Forester D. E. Lauderburn of that State is making his audiences prick up their ears by estimating also the rate at which the trees are increasing in volume and value. Mr. Lauderburn and the cooperating county agent determine by increment borings in a number of sample trees the approximate rate of growth of the timber, then tally a quarter-acre plot and compute the merchantable content of all trees 10 inches and larger in diameter at breastheight. They then estimate the current annual increment per acre in board feet, compute the stand that will be present 10 years hence, apply the current stumpage rate, and deduct the taxes. In a series of demonstrations in Winston County the gain in value per acre per year above taxes was estimated at \$4.16 on a selectively cut tract, at \$1.36 on a neglected one, and at about 75 cents on a tract of mature timber.

## Wood-Lot Improvement Demonstration at Senator Copeland's Summer Home

Senator Royal S. Copeland entertained in April at a woods clinic in the Ramapo Mountains, in southeastern New York. The Senator owns a considerable area of forest land near Suffern, where he has a summer home. On this occasion he invited a group of his neighbors who own forest land to the Rotary luncheon and then took them to a selected woods area, where Paul D. Kelleter and J. D. Kennedy, of the New York State College of Forestry, explained the principles of wood-lot improvement and demonstrated timber marking.

The Ramapo Mountains are covered with a second-growth forest of hardwoods, in which a few conifers are scattered. This forest developed after old-time cuttings in which a very thorough job was done to furnish material to the brickyards along the Hudson. As yet no careful consideration has been given to the proper handling of the forest.

Later in the season, after the cutting operations have been completed, a second woods meeting will be called. At that time Senator Copeland plans to hold an evening session in the Suffern community hall at which wood-lot management will be further explained by words, slides, and movies.

## Farm Timber Crop Sells for a Small Fortune

Timber as a farm crop has paid well in the experience of Ed Thompson, of Red River County, Tex. C. B. Webster, Texas extension forester, tells the story as follows:

Something more than 35 years ago Mr. Thompson bought 1,200 acres of land about 9 miles north of Clarks-ville which he had just finished logging for a timber company. He paid about \$1.25 per acre. Here he built his home and began to farm. Eventually he put 200 acres under cultivation, leaving the rest in timber. He constructed fire lanes to protect his timber land and fought any fires that got a start. He took from the woods such material as he needed for use on the farm, always leaving the best trees to grow. Through the years when he was rearing and educating his children he made a good living from the farm. Today his timber looks like old growth, many of the trees having two or three clear 16-foot logs. Recently Mr. Thompson sold this timber, on the stump, for \$50,000 cash.

## A Wood-Lot Improvement Cutting to Favor Sugar Maples is Profitable

An improvement cutting recently made on a New York farm wood lot resulted in a return, above labor costs, of \$198 per acre, writes Assistant Extension Forester C. A. Gillett. The cutting was a demonstration in which the Genesee County farm bureau co-operated, and the wood lot is the property of Ernest Wilker, Darien Center. The aim of the cutting was to favor the sugar maples and hasten the development of a sugar bush. On the quarter-acre plot chosen for the demonstration 57 trees that were undesirable because of poor form, disease, or overcrowding or because they were of weed species were marked in advance by Mr. Gillett. These trees constituted 38 per cent of the stand. Mr. Wilker's record of labor costs showed that it required 30 hours to cut and work up the marked trees. The product was 700 feet of elm logs valued at \$25 per 1,000 feet, 10 face cords of fuel-wood worth \$4 per cord, and 16 ash fence posts worth 25 cents each. The gross return from thinning the quarter-acre plot was \$61.50. With labor valued at 40 cents an hour there remained a net profit of \$49.50. The cutting left the plot in condition for rapid development into a good sugar bush.



The Rotary Club of Jefferson, in Marion County, Tex., is giving special encouragement to the county Four-H forestry club. L. G. Braden, a Rotarian who owns a considerable area of timberland, offers to any boy joining the club this year the use of and income from as many acres of land as may be needed to carry out a forestry club project, on condition that the boy agrees to stick with the club and complete the work he starts.

## Forestry Lessons for Farm Women's Clubs

At the request of farm women's clubs of Upshur County, W. Va., Extension Forester Thomas W. Skuce has outlined a program of monthly forestry lessons to be followed out by the clubs this summer. Community club leaders representing eight clubs met with Mr. Skuce to discuss the program. He provided each of them with a set of forestry bulletins including publications of the Federal and State Governments, and showed them where answers could be found in these bulletins to a series of questions which he had drafted for their use, dealing with forest-land utilization, farm forestry, forest wild life, State and Federal forests, and watershed protection.

## Four-H Forestry Popular in New Hampshire

No less than 521 New Hampshire boys and girls took part in the work of Four-H forestry clubs in 1928, under the direction of Extension Forester K. E. Barraclough and county agents. There are now 62 such clubs in the State. In 1928 the children planted 139,025 trees, improved 220 acres of woodland, and made 124 wood collections. Richard Sanborn, Epping, won a State championship by thinning, releasing, and pruning 3 acres of young pine, planting 1,000 pines, and making a wood collection. The other championship went to Woodrow Wilson Foss, Barrington, who released more than 3 acres of northern white pine from overtopping gray birch. Among the many individual planting projects was one being carried on for the second year by two Campbell brothers, of Litchfield, for the fixation of drifting sands such as are common in the section along the Merrimack River. These boys had an example of such work before them in the form of a pine plantation established on the sands by their father 35 years ago, in which the trees are now more than 30 feet high and average 4 inches in diameter.

Each of eight counties sent two forestry-club delegates to Camp Carlisle farmers' and home makers' week at Durham for practical instruction in farm wood-lot management. Gold, silver, and bronze medals made available by the Society for the Protection of New Hampshire Forests were awarded in each county for individual forestry work.



In March of this year Paul D. Kelleter, director of forest extension, New York State College of Forestry, gave his fourth annual series of forestry lectures in high schools of New York City. With Frank B. Myers, one of his assistants, Mr. Kelleter lectured for two weeks in junior and senior high schools of the city. The two men gave 40 talks, at which the attendance averaged about 800.

## Traveling Forestry Libraries in Mississippi

Five new traveling libraries have been put into circulation by the Mississippi Forest Service, which for a year has been routing two library units to schools and has had one in use as a part of the county library that is distributed by motor truck from Clarksdale throughout Coahoma County. These library units consist of about 50 books each. They include books on a variety of subjects such as forest botany, conservation, uses of forest products, elementary forestry, and outdoor recreation, and with these a few books of fiction having forest conservation as an element in the plot or having scenes laid in the forest. Sets are made available for loan by the month where steady service to a number of readers is assured.

## West Virginia Forest Scouts

The West Virginia forestry organization is encouraging the appointment of Boy Scouts by scout masters as "West Virginia forest scouts." Each scout so appointed pledges himself to put up 10 forest-fire-prevention posters in public places in March and 10 more in September, to distribute printed matter on forestry during Forest Week, and once a year to write an item of 100 words or more on some forestry topic to be transmitted by his scout master to local papers. A forest scout will be credited with exceptionally meritorious service if he discovers a forest fire and reports it

to the nearest fire warden or county officer, extinguishes or assists in extinguishing a forest fire, or gives a forestry oration in his school.

## Massachusetts Forestry Exhibit Wins Flower Show Prize

Writing of the display put on by the Massachusetts division of forestry at the Boston flower show, held March 18-23 in the Mechanics Building, District Forester D. C. A. Galarneau says:

It was the first time we had enough space for a real show. We put on an exhibit of forest conservation and devastation and one of forest recreation, winter and summer. Although rather dead in color and placed in the midst of floral displays of ravishing brilliancy, the forestry display went over big with a different class of people from that which attends agricultural shows. For the \$1,000 gold cup offered for the best educational display we couldn't hope to compete with a California woman who put on a 3-section display of cactus, desert, and redwoods at an expense of \$25,000, receiving wild flowers from California each morning by airplane. However, we were awarded the North Shore Garden Club's cup, valued at \$100.



The Vermont Special, which left Montpelier on April 9 for a 10-day tour leading through the South and as far west as Des Moines, Iowa, carried as one of its industrial exhibits a display of the products of Vermont woodworking industries prepared by the State forest service, with Assistant State Forester P. H. Merrill in charge.

# Forest Service Notes

## A Survey of Forest Resources and Requirements

A good many estimates of the forest resources of the United States have been made in the past. And from time to time conclusions more or less justifiable have been drawn from these estimates. Some of the estimates were drawn up with a good deal of care from compilations of material gathered for other purposes. None of them, however, has been based on scientific study and investigation designed specifically to provide a full and accurate picture of what we have in timber supplies and what we need.

A fund of \$40,000 provided in the Agricultural appropriation act for the fiscal year beginning July 1, 1929, under authorization of the McSweeney-McNary Act, makes it possible for the Forest Service to begin such a comprehensive survey. When completed the survey is expected to serve as a foundation for a large part of all future forest activities, making possible the drawing up of plans for balancing the forest budget of the Nation so that our forest supplies will always be sufficient to meet our forest needs.

Work on the survey will be begun in the Pacific Northwest and will later be extended to other regions as funds become available. The survey is designed to assemble data on the volume of merchantable timber now available, the present and prospective requirements for forest products, the annual drain on the forests from cutting, fire, disease, and insects, the present growth and the growth that could be obtained through the practice of forestry, the area and location of forest lands and the character of the growth they bear, and certain phases of the distribution of forest products.

Another economic study that the Forest Service is enabled to initiate in the coming fiscal year, through the appropriation of \$25,000 under authorization of the McSweeney-McNary Act, will deal with the financial aspects of private forestry practice. An effort will be made to weigh the economic factors bearing on the opportunity for profit through private forestry practice in different regions and under various conditions. At the outset work will be concentrated in the southern pine region. A third study in the field of forest economics, to which the Forest Service expects to



devote \$10,000 of its 1930 appropriation under the Clarke-McNary law, is an investigation of forest insurance. Early work on this project will be concentrated in one region, probably the Pacific Northwest.

## Research Reserves and Primitive Areas on the National Forests

By L. F. KNEIPP, United States Forest Service

A newly formulated policy of the Forest Service looks toward the permanent preservation of conditions typical of virgin forest on several areas in each major forest region of this country.

With the exception of the national parks and the Indian reservations, the national forests contain the only considerable areas of land within the United States in which the original conditions have not been appreciably modified by human action. Each year is marked by some invasion of such areas, through the extension of roads, of industrial exploitation, or of modern forms of recreational use. These invasions, if allowed to continue, threaten ultimately to reduce our present "wilderness" areas to a condition indistinguishable from that of the common run of publicly owned forest lands in the United States.

It now seems to be indisputably established that such a result would constitute an irreparable loss to science, to education, and to society generally. Scientific study of the laws of nature would be less effective if the opportunity were lost to contrast the operation of such laws in areas modified by human action with their operation in areas not so modified. Plant and animal species of great potential value to science might be eradicated, through incapacity to survive under modified conditions. The stimulus to educational advancement arising from opportunity to study unmodified nature would be diminished. Lost, too, would be the social advantage of perpetuating some examples of the conditions under which the earlier development of the Nation took place and which influenced national ideals, traditions, and modes of life. Added to all these would be the fading from existence of the opportunity for a unique type of outdoor recreation that contributes directly and in marked degree to the maintenance of high mental and physical standards.

During the past decade the Secretary of Agriculture has classified several national forest areas as chiefly valuable for outdoor recreational use and has stipulated that on these areas all other forms of use shall be coordinated with recreation. More recently several of the district organizations of the Forest Service have developed or begun to develop programs for the preservation of "wilderness" areas. The management plans of different national forests provide in a number of ways for partial or complete protection of small areas.

Primarily these different measures have been designed to safeguard recreational opportunities. But in

late years the value of unmodified areas to science and research, particularly forest research, has become more and more evident and has received increasing emphasis from individual research workers. This form of land service must be recognized and provided for. Many tracts of national forest land will contribute more to the advancement of forestry if dedicated to such use than if devoted to commercial timber production or other forms of industrial utilization. Some areas of virgin type already have been designated as experimental demonstration forests in connection with research work.

In view of all these considerations the Forest Service is undertaking progressively to provide for the permanent dedication and preservation of two classes of areas—research reserves, to meet needs of science and education; and primitive areas, set aside for purposes primarily inspirational, educational, and recreational.

So far as is practicable, the system of research reserves will be designed eventually to insure the preservation of virgin areas typifying all important forest conditions in the United States, and permitting continuity of study to climax types. This will probably mean a half dozen such areas for each forest region. Each experiment or demonstration forest should embrace one such area. But if a forest type is adequately represented in some other permanent form of reservation such as a national park, it may be found unnecessary to preserve a duplicate example on a national forest.

Within research reserves, scientific and educational use will be dominant and exclusive. Only very carefully restricted and regulated public occupancy will be allowed. Industrial utilization of resources will be permitted only in the rare case in which it may be employed under careful restriction to work out a scientific problem. Caution will be exercised in determining the boundaries of research reserves to avoid the unnecessary inclusion of lands not essential to the scientific or educational use of the area. The area required for the maintenance of virgin conditions over any considerable period of time will vary with the type of forest involved, or possibly with climatic and topographic conditions; under average conditions, it is expected, the minimum will be about 1,000 acres.

The use of research reserves for research purposes by other Federal or State agencies will be freely and fully allowed.

On tracts set aside as primitive areas, the intention will be to maintain primitive conditions of travel, habitation, subsistence, and environment. The standard of primitiveness will necessarily be a varying one, approximating sometimes the environment of the Indian, in other cases that of the early fur trader or trapper, the pioneer miner or the pioneer stockman or settler, or the logger. No hard and fast rules will be established as to whether or under what circumstances timber cutting, grazing, water storage, trails, roads, habitations or other structures, partially or fully im-

proved camp grounds, commercial camps, resorts, etc., are to be prohibited or allowed on primitive areas. These questions must be determined in the light of the conditions peculiar to a given area and of the types of human needs it is to serve.

The establishment of a primitive area will not result in any reduction in the standards of fire prevention warranted by the existing circumstances. The roads, trails, telephone lines, and lookout towers required to give the area adequate protection will be installed as in other similar national-forest areas, but with due regard to the preservation of primitive values. Road or trail construction other than that required for fire prevention, administration, or forest utilization will be confined to the minimum. Occupancy under permit also will be held to the minimum.

## Results of Practical Tests of Treated Ties

Treated railroad ties of cottonwood, western hemlock, western larch, Douglas fir (mountain type), and white fir are giving satisfactory service in test tracks laid by the Northern Pacific Railway and the Oregon Short Line Railroad, the Forest Products Laboratory reports. Creosoted cottonwood ties at Lolo, Mont., and Marshall Junction, Wash., after 18 years' service appear to have a prospective average life of more than 20 years. Western hemlock ties at Missoula, Mont., have been in service nearly 19 years with less than 1 per cent removed. Creosoted western larch ties in a test track at Thompson Falls, Mont., have been in service about 13 years with less than 3 per cent removals due to mechanical wear and no removals due to decay. Zinc-treated ties of this species in a Plains, Mont., test track after 20 years' service appear to have prospects of an average life of about 20 years. Mountain-grown Douglas fir ties treated with creosote that have served 12 to 13 years in the Thompson Falls track give evidence of ability to complete an average life of 15 years or more; and zinc-treated ties of this wood in the Plains test track have been in service about 20 years, with removals of 76.7 per cent. Creosoted white-fir ties in the Thompson Falls track have served 13 years with but 2½ per cent removals due principally to mechanical wear.

In the Oregon Short Line test tracks in southern Idaho, after from two to five years' service ties of western yellow pine, lodgepole pine, mountain Douglas fir, coast Douglas fir, Engelmann spruce, and white fir that were treated with straight zinc chloride are checking and splitting more than ties of the same species treated with straight creosote, mixtures of creosote and other oils, or zinc chloride followed by petroleum (a 2-movement treatment). These results constitute further evidence that a straight zinc chloride treatment is not entirely suitable for ties to be used in very dry climates such as that of southern Idaho.

## Growth of Northern Hardwood Stands

A study of the rates of growth of northern hardwoods has been carried out in northern Wisconsin by the Lake States Forest Experiment Station with the cooperation of the agricultural experiment station of the University of Wisconsin and several Wisconsin lumber companies. On the basis of data obtained by examining 24 sample plots, located principally in Florence and Forest Counties and having an aggregate area close to 112 acres, calculations were made as to the rate of growth in virgin forests, on clear-cut land, and in partially cut stands. The principal species involved were sugar maple, yellow birch, eastern hemlock, and basswood. Mixed with these were beech, American elm, northern white cedar, balsam fir, occasional northern white pines, and other species characteristic of northern Wisconsin.

Conclusions from this study are reported by Raphael Zon and H. F. Scholz, of the Lake States Forest Experiment Station, as follows (all calculations are for unburned stands):

An old virgin hardwood-hemlock forest produces about 213 board feet per acre per year. This annual growth, however, is counterbalanced by loss through windfall, decay, and death of some of the overmature trees with the result that there is no net growth. An old hardwood-hemlock forest can maintain its merchantable volume indefinitely, provided it is not visited by exceptionally severe storms or epidemic attacks of insects or disease. Although there is no physical loss to the forest there is an economic loss, because the annual growth of 213 board feet merely replaces the loss through decay and windfall and serves no useful economic purpose.

On land cut clean of its original forest the growth is at the rate of from 55 to 65 board feet per acre per year. This growth, in the case of complete stripping of all trees down to 6 inches in diameter, is not available until the stand reaches an age of from 80 to 100 years.

In stands cut over partially or selectively, the growth varies from 110 to 195 board feet per acre per year. During the 20 to 30 years next following cutting, growth in volume is at the rate of 120 board feet per acre per year in stands from which 89 to 96 per cent of the merchantable volume has been removed; at the rate of 148 board feet per acre per year in stands from which 63 to 85 per cent of the merchantable volume has been removed; and at the rate of 174 board feet per acre per year in stands from which 26 to 58 per cent of the merchantable volume has been removed.

Partial cutting does not increase the loss through windfall or mortality. The normal loss through these causes is about 16 board feet per acre per year, or about 10 to 11 per cent of the average annual growth of 145 board feet.

Clean cutting changes the composition of the future stand. On areas cut clean, the new stand contains more yellow birch, basswood, and American elm, and less sugar maple and eastern hemlock than was in the original forest.

Partial cutting encourages sugar maple at the expense of yellow birch, basswood, and American elm. Continued partial cutting may, therefore, convert the forest into an almost pure sugar maple stand. This is not an economic disadvantage, as sugar maple is one of the more important trees in northern Wisconsin.



## Slash Disposal on Steep Slopes in the Douglas Fir Type

By L. D. BLODGETT, United States Forest Service

The logging of steep slopes in the Douglas fir type often leaves the forester a choice between two evils—burning the slash with the risk that the fire will destroy the seed trees and the protection forest above the cutting line, or leaving the area unburned and thus making it necessary to provide intensive fire protection until the new cover is established. Some burning is always needed to break the area up for fire-protection purposes and to dispose of exceptionally heavy slash that if left on the ground would shade it to such a degree as to preclude Douglas fir reproduction. It is usually advisable, also, to burn such areas along main-line railroads as would otherwise constitute a continuous hazard to the entire operation. Practically all foresters now agree that burning, in itself, is not essential to reproduction or to the control of species.

After it has been decided to burn a certain area the question of when and how to burn requires careful study and the application of sound judgment. The peculiar aspects of the area must be considered, its relation to adjoining areas, and the order of cutting. In fact, these things should be considered in advance of logging and plans affecting the entire operation should be laid two or three years in advance. Another very important factor to be considered in timing a slash fire is the presence or absence of a seed crop.

The two periods during which slash may be burned are the fall and the early spring.

The advantages of fall burning as compared with early spring burning are that it leaves the area cleaner, hence less liable to subsequent burning and in better condition for Douglas fir germination; that it involves less risk from hang-over fires; and that, if the burning occurs in a good seed year just before seed dissemination, it allows the reproduction to get an even start with the weeds and shrubs which always begin to grow the summer after the burning. Disadvantages of fall burning are that it burns deep, destroying whatever seed may be stored in the duff; burning must be done prior to the normally very heavy fall rains, at a time when the surface under the green timber is just as dry as or drier than the slash, so that control of the fire is very difficult; and that slash burned at this time of year produces a very intense heat, which on a steep slope is most destructive to seed trees.

During the fall of 1926 the slash was burned on two areas on the Webb Logging & Timber Co. operation on the Olympic National Forest, Wash.

The first, an area of about 60 acres lying on a steep slope with a south exposure, was fired on September 9. The slash on this area was comparatively light. There had been considerable rainfall during the month; in the open the slash was only fairly dry and under the timber it was decidedly damp. The weather

had been very murky and oppressive all day, and the Weather Bureau forecast was for rain in considerable quantities. The fire was started about 7 p. m. along the top of the ridge and was allowed to work its way down the hill. By 8 p. m. a dense fog had rolled in and by 10 p. m. this had turned to rain, which continued for several days. A more ideal condition for burning could scarcely be hoped for; still the excessive roll of burning material on this steep hillside spread the fire so rapidly down the hill that the whole area was afire before the fire had completely burned out at the top. The heat was so great that a seed tree would burst into flame and its crown burn out before the fire on the ground had reached its base. Several trees were uprooted and thrown up the hill by the terrific draft. There was little or no wind except that created by the fire, and the relative humidity was above 90 per cent. In spite of fog, rain, and absence of wind, out of 50 or 60 trees only 8 survived the fire. These stood near the bottom of the slope, where the ground was less steep, and no heat was drawn through their crowns.

As a trial of a late fall burn, an area of like size was burned on November 3. There had been a great deal of rain during the fall, and the material under the green timber was positively wet. A few hot days had somewhat dried the slash. We started the fires, as usual, along the green timber at the upper edge of the area, about 1.30 p. m. The weather was clear, with no wind. Because the material was decidedly damp, considerable difficulty was experienced in getting it to burn. By firing it in strips, however, we finally got it to burning briskly. When the fire had burned down from the timber 150 feet or more, as it was growing late in the afternoon the decision was made to start fire along the lower edge of the area and let it run to meet the upper fire. This created such a volume of heat that the fire jumped the 150-foot strip already burned, crowned in the timber, and in one flare ran one-fourth of a mile to the top of the ridge. The surface of the ground under the timber did not burn over until later.

In both these cases burning was done under what appeared to be the most favorable conditions, yet considerable damage was done to seed trees and protection forest and in the second instance it looked for a few minutes as if a serious conflagration would result. However, both these areas were burned very clean and are in ideal condition for reseeding.

The advantages of spring burning as compared with fall burning are that in spring, since the slash in the open usually dries out much more quickly than the standing timber does, the chances of damaging the surrounding timber are much less; that the fires do not burn deep enough to destroy entirely whatever seed may be in the duff; and that fires burn less rapidly and create less heat, and therefore are less destructive to seed trees. The disadvantages of spring burning are that it destroys seed from the fall seed drop, on top and near the top of the ground; if it is done early

enough to permit reasonable assurance of sufficient wet weather to put the fires out, not enough of the material is burned to reduce the fire hazard to any great degree; later, when a reasonably clean burn may be expected, there is a very high risk of adverse weather conditions developing before fires can be completely extinguished; and the risk of hang-over fires breaking out is very high. Slash resulting from fall and winter logging can seldom be burned until late in the spring, and a poor burn usually results.

In the spring of 1926, a large body of slash was fired on March 31. The area was on a moderate slope having an eastern exposure, with the railroad grade along the upper edge. The humidity rose rapidly in the evening, and although a crew of men worked all night they succeeded only in getting a few small spots afire. The fire was set along the grade and allowed to work down the hill. The following day an east wind sprang up and by 11 a. m. was blowing a gale, with the relative humidity at 19 per cent. In spite of the efforts of 150 men using three locomotives the fire jumped the track and burned over a quantity of felled and bucked timber. As soon as the wind went down in the evening the humidity came up and the fire went out almost completely. The few remaining spots were put out during the next two or three days with no further difficulty. Furiously as this fire seemed to burn, subsequent examinations showed that it had burned only in spots and had done very little toward reducing the fire risk.

According to my experience, fire lines on steep slopes at best can not be depended upon. If properly located they can be used to stop a slow-creeping fire or a fire that is working back against the wind. They are practically useless around the upper side of a slash fire to prevent the fire from entering green timber. A fire line is equally useless on the lower side of a fire on a steep area, on account of the roll.

With an area of between 400 and 500 acres of slash to be burned on this operation in the spring of 1928, a somewhat new departure from the conventional methods was tried out. This area for the most part is very steep and has a general south and southeast exposure. Being cut up by sharp spur ridges and canyons, it has many northeast and southwest slopes. The original plan was to burn the area in the fall of 1927, but logging was not completed in time to allow this. The burning could not be postponed until the next fall, for by that time the adjoining timber would be down, making a continuous body of slash into the next unit.

Conditions were carefully studied, and burning was started on March 1. It was found that the slash would not burn except on the steepest slopes having a southwest exposure. Every day that the weather was favorable a crew of four men was sent out with oil and torches to spread the fire on the driest portions. At the end of a week practically all the south and southwest slopes were burned over, all north and northeast slopes being still covered with snow. As fast as

the material dried out it was burned, and by the time the weather became dangerous the entire area had been burned over.

The slash on this area was comparatively light. On steep areas this is generally the case, with the result that where the slash burns at all it burns very clean. On areas where the débris is exceptionally heavy or matted this method probably would not work so well. The burning caused very little trouble except to require some attention at the bridges, and caused no damage at all to the seed trees. It is a rather long-drawn-out process, but it is believed that this will prove far less objectionable than waiting until the whole area is ready and then having an uncontrollable fire. No fire lines whatever will be used in connection with this sort of fire. In this instance a locomotive with a tank car was at hand to protect the bridges. Another advantage of this method is that most of the hang-over spots burn themselves out without needing to be worked. Of course this is an experiment that has not yet run to a conclusion, and more may be said about it later.

My belief regarding slash disposal on steep slopes is that the best practice is to leave most of the slope unburned, planning the operation so as to allow this, and burning on only such portions as must be burned to give maximum protection from accidental fires.



In the 9-month period ending with March, 1929, receipts from the use of the national forests totaled \$3,901,929. This is \$600,328 more than the national forest receipts for the corresponding period of the preceding fiscal year. An increase of \$615,501 is represented by the \$2,761,998 brought in by timber sale, one of \$5,986 by the \$101,283 brought in by water-power permits, and one of \$4,905 by the \$16,130 brought in by the sale of turpentine. Receipts from grazing fees, amounting to \$707,317, showed a decrease of \$27,153.



United States immigration officers patrolling the Cleveland National Forest, Calif., are to be armed for fire fighting this season, each officer carrying in his car a shovel and ax furnished by the Forest Service.



Correction: The item on page 13 of the March, 1929, FOREST WORKER about measurements made by foresters of the Lake States Forest Experiment Station on hard maple cordwood cut near Ruse, Mich., should have stated that the average quantity of material in a standard cord was found to be as follows: In a cord made up of round sticks of various diameters, 65 cubic feet of wood and 15 cubic feet of bark; in a cord made up of round sticks having a middle diameter of 5 inches, 39 cubic feet of wood and 11 cubic feet of bark; and in a cord made up of round sticks having a middle diameter of 20 inches, 73 cubic feet of wood and 15 cubic feet of bark.

An example of the gain made in a period of 22 years by young red spruce released through the girdling of old hardwoods under which they formerly struggled for existence is visible at Corbin Park, N. H., where an experiment was instituted that long since by the United States Forest Service. A recent analysis shows that volume growth of the spruce has been more than

five times as rapid on the heavily girdled plot, and three times as rapid on the moderately girdled plot, as on the plot where the old hardwoods were left intact. The heavily girdled plot, on which only 2 square feet of basal area of hardwoods was left, has produced approximately 10 cords of spruce and balsam pulpwood per acre in 22 years.

## General Forest News

### Forestry at Crossett

By L. R. Wilcoxon, Crossett Lumber Company, Crossett, Ark.

Several years ago we began to notice that among the logs which we were manufacturing into lumber were some that had reached a merchantable size since the beginning of our sawmill operation in 1902. This suggested that it might be possible to prolong the life of our operation by growing timber on cut-over lands. A hasty survey of our holdings brought it home to us very forcibly that E. W. Gates, general manager of the Crossett Co., had displayed rare judgment in blocking up the original timberlands. Mr. Gates's appreciation of growth possibilities had led to the purchase of areas of immature pine for future operation.

The Crossett holdings are located in one of the most favorable timber-growing sections of the South. Ultimately we became convinced that timber crops could be grown profitably on our lands if the logging of virgin areas were conducted in such a way as to leave the land in a satisfactory condition for natural reforestation and if an adequate scheme of forest fire control were introduced.

This was not a hasty decision; the idea developed gradually over a period of years, during which time various factors contributed to its growth. Charles H. Watzek, now one of the directors of the company, who was graduated from the Yale Forest School in 1911, was instrumental in having the southern spring field work of the school held on the Crossett property in 1912. The instructors who conducted this work prepared a brief report on the possibilities of forest management on the property and also one on timber utilization in the woods. These reports helped to increase the gradually broadening interest in the subject of industrial forestry, which at that time was a child disowned by southern pine operators. The school again held field work on the company's holdings in 1919, and each year since 1924 Yale students have come to spend two weeks studying the logging and forestry work of the company.

In the summer of 1922 Prof. H. H. Chapman, of the Yale Forest School, made a preliminary examination of the holdings of the company, following which he definitely recommended that we inaugurate a forestry

policy and employ a technical forester. This was done during the latter part of 1922 when W. K. Williams, jr., came to the company, from the Yale Forest School, as its first forester. Mr. Williams left in 1926 to become extension forester of Arkansas. In the spring of 1927 A. E. Wackerman, a Yale Forest School graduate from the Lake States Forest Experiment Station, became resident forester. Under his direction the work has greatly expanded and rapid progress has been made along both silvicultural and protection lines.

One of the most important problems in timber cropping in the southern pine region of southeast Arkansas is the prevention and control of forest fires. A study of our fire problem showed that a good part of the fire damage was traceable to our own logging operations. This led us to put our own house in order by substituting oil for coal and pine knots as fuel for woods locomotives and loaders. The woods crews, also, have become most alert to prevent the spread of fire, and we no longer hesitate to use any number of loggers necessary to fight forest fires in the vicinity of the logging operation. Thus the company has eliminated the hazard formerly arising from its own operation.

The company has also taken action to reduce the fire damage to its own and adjacent property from other causes. Its Arkansas property has been divided into four forest protection districts, and its lands in Louisiana are in a district that is handled in cooperation with the State forester of Louisiana. Each of the Arkansas districts comprises from 150,000 to 200,000 acres. In some instances half the area in a district is noncompany land that is protected at company expense and without any local, State, or Federal aid whatsoever. Each district in Arkansas is in the charge of a permanent resident chief having under him several part-time fire wardens who form the first line of defense in fire fighting and when necessary serve as foremen of fire-fighting crews. Each district chief is equipped with a Ford truck, spray pumps, rakes, axes, and fire swatters. Each warden, also, has a supply of rakes and swatters. (The swatter, a most effective piece of equipment for beating out fires, is made by fastening a 30-inch length of old 12-inch leather belting to a 6-foot handle.)

The duties of the district chief are many, including cooperating with neighbors in every possible way, opening and maintaining woods roads and fire lines, supervising fire prevention and control measures, and handling any incidental company business that may arise in the district. We have opened up several hundred miles of old roads, which makes it easy to get into any part of the territory with a light car. We have five lookout towers 93 feet high, manned by lookouts who are available at any time of the year. The towers have telephone connections with the district chiefs, the wardens, and the office, so that fires can be reported and crews organized without loss of time. The towers are so located that every portion of our holdings is within the range of at least two lookouts. This makes it possible to get cross-bearings on a fire and locate it exactly by means of alidades similar to those used by the United States Forest Service.

A system of silvicultural practice was worked out for our use under the direction of professional foresters. Some of our local men have been trained to select the proper kind of trees, at correct intervals, for seed trees, and it is now our practice to leave seed trees on all logged areas. When possible, we choose loblolly pines for seed trees; we prefer the loblolly for second growth, rather than the shortleaf pine with which it is intermingled in the present stands on our land, because it is more thrifty and faster growing, has a better root system, and is better able to withstand high winds.

Our method of team logging seldom causes damage to the trees we leave for seeding. Our cutters, also, are careful to avoid damage to trees below logging size.

Investigations a few years ago showed that we could not handle profitably trees that were less than 15 inches in diameter at the stump. An analysis of the cost of production and sale value of lumber from small trees indicated that we were losing 56 cents per 1,000 board feet in cutting 14-inch trees and 72 cents per 1,000 board feet in cutting 12 and 13 inch trees. The prospective profit on these small trees after 10 years' further growth was found to be 86 cents per 1,000 board feet for the 14-inch trees and 64 cents per 1,000 feet for the 13-inch trees. A 20-year wait, according to the analysis, promised profits of \$1.35, \$2.02, and \$2.27 per 1,000 feet, respectively, for trees that were 12, 13, and 14 inches in diameter at the stump.

After experimenting for several years with leaving seed trees, protecting young growth from logging damage, keeping fire out of the woods, and cutting only trees 15 inches or more in diameter, our company finds that these practices do not necessarily increase costs but, if plans are well thought out, actually reduce costs.

The responsibility for maintaining the lumber output of the South rests on the shoulders of the loggers. If all loggers saw clearly the benefits that are inherent in the perpetuation of the timber supply, we should not now be confronted with the spectacle of so many

of our mills cutting out and leaving communities desolate. Of course this doesn't mean that we can maintain production at the present rate; but, at least, we can have one permanent mill where we otherwise should have three cut-out mills.

## Paper Company Starts Timber Growing as It Builds Its Mill

While building a sulphate pulp mill in Mobile, Ala., at an expense that is expected to amount to about \$6,000,000, the Southern International Paper Co. is starting out to raise pulp wood for the mill's future supply. It is expected that the mill will consume about 300 cords of pine pulp wood a day and produce about the same number of tons of pulp, mainly for the manufacture of kraft papers. As a beginning in providing pulp-wood supplies to feed the mill the company has purchased 37,000 acres of cut-over lands in Baldwin County, near Gateswood, formerly owned by the Southern States Lumber Co.

Myron L. Kahler is employed by the company as forester, and Richard A. Bingham has been installed as resident woods superintendent with a staff of three patrolmen. Firebreaks have been constructed along all roads and on all section lines by plowing two parallel lines (of two furrows each) 10, 15, or even 25 feet apart, and burning the debris between them. Eleven tall trees have been spiked for use as lookout points. In its endeavors to keep down fire damage the company has the cooperation of the Alabama Commission of Forestry.

This property is a choice long-leaf area on which regeneration is virtually complete, State Forest Inspector Harry F. Smith writes. While pulpwood production is the main purpose with which it is being managed, the company expects to market naval stores, ties, piling, poles, and lumber.

Through the operation of the pulp mill in Mobile, Mr. Smith observes, farmers in areas contiguous to the Alabama and Tombigbee Rivers will be provided with an outlet for thinnings and small timber that they would otherwise consider waste.



An offer of the Bureau of Foreign and Domestic Commerce to join with the naval-stores industry in cooperative research was accepted in a resolution adopted at the "get together" conference of naval-stores interests at Pensacola, Fla., February 20-22. The bureau's suggestion is that the work should begin with a study to discover the various present uses of turpentine; the development of estimates of the volume consumed in each of these uses; and a complete study of turpentine merchandising methods as compared with methods employed in merchandising other commodities.

## The Fight Against European Larch Canker

Efforts to eliminate the European larch canker as a menace to forests of Douglas fir, western yellow pine, and other valuable species in this country are being made by the office of forest pathology, Bureau of Plant Industry, on the basis of a Federal appropriation of \$35,000. Of this appropriation \$10,000 has already been made available and the remainder will become available on July 1 of this year. The Federal campaign includes, first, scouting to discover any new infections, beginning in New England and working westward, paying particular attention to places where European larch and Douglas fir have been planted as ornamentals; and second, research to confirm the identification of the disease. The latter phase of the work is complicated by the fact that the parasitic European fungus very closely resembles a native fungus, not an active parasite, that is generally distributed on the native eastern larch from Newfoundland southward and westward to unknown distances.

Practically all the trees that have been found to be infected with the parasitic fungus have been destroyed. These included imported European larches, Japanese larches, and Douglas firs and western yellow pines, growing in Massachusetts and Rhode Island.

## Needleminer Attacks Lodgepole Pine in Central Oregon

By J. E. PATTERSON, United States Bureau of Entomology

Near the town of Lapine, in central Oregon, a lepidopterous needleminer not known to have occurred previously in that State made its appearance in 1925, defoliating lodgepole pine over an area of about 40 acres. By July, 1928, the infestation had spread over 130 square miles of lodgepole forest. The Dalles-California highway passes through the main portion of the infested area, and defoliated trees may be seen on both sides of this road for a distance of 13 miles. If the infestation continues to develop at the same rapid rate, it will soon spread throughout the extensive stands of lodgepole pine that are contiguous to the present infested center.

This undescribed *Recurvaria* closely resembles *Recurvaria milleri* Busck in size and markings, in habits, and in character of damage. It differs in life cycle, having one complete generation each year instead of the biennial life span of *R. milleri*. Adult moths were collected in July, 1927, and in August, 1928. The season of greatest activity is from June 20 to September 15. So far the insect is not known to attack any species other than lodgepole pine.

On trees attacked by this insect the body of the needles is hollowed out by the feeding larvæ, with the result that the foliage dies. The defoliation results in

impairment of tree vitality and reduction of growth rate.

Trees that have been greatly suppressed by repeated defoliations are very susceptible to bark beetle attack. There is an incipient infestation of the mountain pine beetle in the lodgepole pine stands near Lapine, and serious developments may be expected from this cause if the needleminer infestation persists through the next few years.

## Relief for Ivy and Sumac Poisoning

To those who suffer from ivy and sumac poisoning the Bureau of Plant Industry recommends lavish use of soap and water as soon as possible after exposure. The poison requires some time to penetrate the skin, and until it has done this it may be removed by repeated washing and rinsing. Ordinary kitchen or laundry soap having an excess of alkali is best for the purpose, and should be used with hot water. The soap should be applied freely so as to produce an abundant, heavy lather on the skin surfaces that have been exposed, then rinsed off completely. This operation should be repeated with fresh water not less than three or four times. The hands, and especially the nails and the tender skin between the fingers, should receive particular attention. Careless washing may serve to spread the poison. Hard scrubbing with a stiff brush is not advised, as it may rub the poison in and stir up infection; if wash cloths are used they should be used in series, a fresh one for each washing. Even if washing is not begun before the inflammation develops it should be tried in order to remove from the skin any traces of the poison that can still be reached.

It is possible also to remove the poison by cleansing the exposed parts repeatedly with alcohol diluted with an equal quantity of water. Alcohol, however, merely dissolves the poison, and unless applied in such a way as to insure its complete removal may spread it over wider areas. The alcohol may be dabbed on with a piece of absorbent cotton and should be promptly removed with a dry piece, fresh cotton being used in each of several repetitions of this process.

Some of the salts of iron which have a neutralizing effect on the poison are reported to have been used with good results as preventives. A solution of 5 parts of ferric chloride in 95 parts of a half-and-half mixture of water and glycerin, or a solution of 1 part of ferrous sulphate in 5 parts of water, is recommended as a local application for this purpose. Either of these solutions may be applied freely to the skin and allowed to dry on it in anticipation of exposure to the poison. Such solutions are also very helpful if used soon after contact with the plants.

As a remedy for poisoning a 5 per cent solution of potassium permanganate applied locally is reported to be very effective. The brown stain caused by this solution will gradually wash off, or may be removed

more rapidly with lemon juice or with a 1 per cent solution of sodium bisulphite.

For relieving the inflammation, simple remedies such as local applications of solutions of cooking soda or of Epsom salt, one or two heaping teaspoonfuls to a cup of water, are said to be ordinarily as helpful as any. Fluid extract of grindelia, diluted with 4 to 8 parts of water, is often used. Solutions of this kind may be applied with light bandages or clean cloths, which should be kept moist and should also be changed and discarded frequently in order to avoid infection. During the night, or when moist applications can not be used, the poisoned surfaces should be carefully cleaned and dried and left exposed to the air rather than tightly bandaged. Immersing the poisoned parts for several minutes in water as hot as can be borne, or where this is impracticable applying hot towels, is recommended to relieve the itching. It increases the discomfort at the moment of application but is followed by a period of great relief. In the early stage remedies with a fatty or oily base, such as ointments, should not be used, as grease or oil tends to dissolve and spread the poison. In the later stage, after the toxic material has exhausted itself, zinc-oxide ointment and similar mild antiseptic and astringent applications hasten healing.

The formula for a simple remedy that may be dabbed on the poisoned parts or applied to them by saturating one or two thicknesses of a light bandage, and that is useful at both the early and the late stage, is as follows:

Zinc oxide.....	15 grams
Phenol.....	2 grams
Lime water to make 250 cubic centimeters.	

Before this remedy is applied the skin should be thoroughly cleansed.

## Germination Tests on Birch Seed at Boyce Thompson Institute

A series of germination experiments carried out with birch seed at the Boyce Thompson Institute for Plant Research are described by Hilda C. Joseph in the Botanical Gazette of January. The seed used were of the four species sweet birch (*Betula lenta*), gray birch (*B. populifolia*), paper birch (*B. papyrifera*), and yellow birch (*B. lutea*). Seed dry-stored in the laboratory for one month were found to germinate well at a temperature of 32° C. and at an alternation of 15°-32° C., but did not germinate well at constant temperatures of 25° C. or less. After one and one-half years' dry storage at laboratory temperature the seed required remarkably high temperatures for germination, the minimum germination temperature being 30° C. for sweet birch and about 20° C. for the three other species.

The degree of heat required for germination was much reduced when the seed were afterripened by being stored for a time in a moist condition at low temperatures—that is, in conditions approximating

those under which in nature most of the seed would have spent the winter buried under leaves and snow on the forest floor. Four weeks of afterripening at 0° or 5° C. put the seed into condition for excellent germination at 15° C.; 6 to 8 weeks of such storage prepared the seed for good early spring germination in outdoor seed beds; and 5 or 6 months' storage at 0° C. was followed by profuse germination even at that temperature.

In these experiments the seed were afterripened in lots of 200 on filter papers in Petri dishes, in which they were also germinated. Moist sand, granulated peat, and blotting or filter paper were found to be equally effective as a medium for stratifying seed for the afterripening process; thus the seed appear to be indifferent to a considerable range of acidity in the medium. Germination of dry-stored seed was found not to be affected by variations in intensity of light and oxygen pressure. Seed sterilized with 0.2 per cent uspulun for one-half hour showed a slightly lower percentage of germination.

Seed of paper birch were found to be less dormant than those of the other species studied, and to fall in vitality more rapidly in unfavorable conditions.

Seed of sweet birch and gray birch kept perfectly during one year of air-dry storage at room temperature, while those of paper birch and yellow birch fell in viability. The optimum moisture content for paper birch seed stored at room temperature in sealed containers was found to be 0.6 per cent. Gray birch seed kept best with a moisture content of 5.2 per cent. Sweet birch seed kept well in all except very humid conditions during one year's storage. Stored at ice-box temperature, seed with higher moisture content kept as well as seed low in moisture for one and one-half years.

Experimenting with seed of sweet birch, Miss Joseph found that birch seed are harvested to best advantage after the catkins have dried on the tree, but before they have opened far enough for a considerable proportion of the seed to be shed. The seed should be shaken from the catkins, dried on well-ventilated racks, and stored. About six weeks before planting the seed should be stratified in a suitable moist medium at temperatures of from 32° to 41° F. After such treatment they will germinate in the seed beds in early spring. It takes approximately one month to six weeks for a full stand of young seedlings to appear above the surface of the soil. Early spring planting is recommended.



The Field Museum of Natural History has sent L. Williams, a wood technologist of its staff, to South America to make a survey and collection of tropical woods. The expedition is expected to take Mr. Williams 2,300 miles along the Amazon River and across the Andes Mountains, alone except for natives.



## St. Paul Municipal Forest Experiments Result in Planting Suggestions

By J. H. ALLISON, University of Minnesota

For 14 years the water department of St. Paul, Minn., has been developing a municipal forest on land surrounding Lake Vadnais, which lies about 7 miles due north of the city. With the cooperation of the University of Minnesota, plantings have been made every year since 1914. The plantations now cover 225 acres. Part of the tract has a scrubby growth of native oaks.

This tract lies near the center of the hardwood transition belt between the northeastern section of Minnesota, formerly forested with conifers, and the prairie section in the southwestern part of the State. Of the three soil types represented two, the "Miami fine sandy loam" and the "Merrimac loamy fine sand," are among the more productive soils of this region. The third, the "Hinckley fine sand," is very unproductive. Originally the entire upland area within the tract was covered with an almost pure stand of oak in which the red, scarlet, and bur oaks predominated. Even on the better soils the trees were scrubby, and on the poorer soils mature trees were often less than 30 feet in height. Few trees at 75 years of age were large enough or of sufficiently good form to provide material for small sawlogs or railroad ties. Otherwise, firewood and fence posts were the only salable products that could be obtained.

The planting plan calls for converting the existing oak stand into a forest chiefly of conifers, retaining some of the oaks for the sake of improving the fertility of the soil and aiding in the natural pruning of lower branches from the conifers. Since the oaks sprout vigorously, they can be retained in the stand for many years without being given much attention.

The second purpose of the planting is to get information on the value of various conifers as species to be grown in the hardwood transition forests of Minnesota and Wisconsin, a region about 7,000,000 acres in extent.

On the poorer soils have been planted jack pine, Norway pine, the Riga variety of Scotch pine, white spruce, and Norway spruce. On the better soils these same species have been used, with the exception that Scotch pine of German and Swedish origin has been substituted for the Riga variety, and with the addition of northern white pine, blue spruce, western white spruce, balsam fir, eastern red cedar, northern white cedar, Douglas fir, and white ash.

On the poorer soils the most vigorous growth is being made by the jack and Scotch pines. Ten years after they were planted as 2-1 stock, trees of these species have reached breastheight, diameters of 2 to 3 inches and total heights of 10 to 16 feet. The Norway pine made a slower start but is now growing vigorously; in 1928 its height averaged about half that of the jack

pine planted with it, in equal numbers, in plots on which these figures are based. On the better soils the northern white pine has grown faster than any other species; 2-1 stock planted in 1915 reached in 1928 a maximum breastheight diameter of about 6 inches and a maximum height of more than 20 feet. Norway spruce planted at the same time in mixture with this northern white pine was severely damaged by frost during each of the first four winters after planting, but has now completely recovered and is growing fully as fast as the northern white pine, perhaps faster. Norway pine, Scotch pine, and blue spruce are all doing well on these soils. The white and western white spruces have suffered heavy mortality when subjected to severe drought in the first growing season in the field; but it is too early to pass judgment on them.

Results obtained thus far with the plantations at Lake Vadnais permit the following tentative conclusions, applying to the hardwood transition forests of Minnesota and Wisconsin: Norway pine is the safest species to use on all classes of soils; northern white pine, white spruce, and Norway spruce are satisfactory for use on the better soils, and perhaps even on the better portions of the poorer soils; a favorable first growing season after planting is necessary if spruce plantations are to be successful; jack and Scotch pines should not be used until more is known about controlling their insect enemies; red spruce, balsam fir, Douglas fir, eastern red cedar, and northern white cedar are not satisfactory species to use here for forest planting, because of slow growth and low percentage of survival; the survival of all species is much higher if the trees are planted in furrows plowed just before the planting is made than if furrows are not used; and some shade is a great help to the planted trees during the first season after planting, particularly during droughts.

## Department of Agriculture Adopts New Plant Name Standard

Standardized Plant Names, published by the American Joint Committee on Horticultural Nomenclature, has replaced Webster's Dictionary as the standard for the spelling of common names of plants in publications of the Department of Agriculture. One of the principles followed in this work is that "whenever a common name properly belonging to one genus is used as a name for a plant of some other genus (unless rarely where very closely related) it is to be used only as part of a compound name, written either with a hyphen or solid." While observing this principle in general, the department will deviate from it by retaining the following well-established timber trade names: Western red cedar, eastern red cedar, southern red cedar, southern white cedar, northern white cedar, southern cypress, incense cedar, Douglas fir, yellow poplar, and red gum.



## Eleventh Southern Forestry Congress

(From reports by C. F. EVANS and A. B. HASTINGS, United States Forest Service)

The Southern Forestry Congress at New Orleans and Bogalusa, La., April 4-6, spent most of its time on specific problems of the southern timber grower. The discussion revolved around two main questions—one of them, how and to what extent is timber growing good business in the South and what has been learned about it through experience; the other, what is the effect of present methods of taxing timberland and what changes are needed. The field day at Bogalusa was devoted to an examination of what the Great Southern Lumber Co. has actually done about timber growing. The discussions and activities of this meeting provided striking evidence that southern forestry has got down to brass tacks and is beginning to drive some of them home. More than 300 representatives were registered for the congress and they came from all of the 16 Southern States. And in addition to the regular program, meetings were held by various groups interested in the South's progress in forestry, including an all-day session of the State foresters of the South on April 3 at which these State officers formed a permanent organization, a conference of extension foresters of the South, and a meeting of the southern section of the Society of American Foresters.

The study of cases was kept before the meeting to an unusual degree, as speaker after speaker told of his own methods of handling his timberland and of the results obtained. George T. Houston, of the Houston Lumber Co., Vicksburg, Miss., described the method of selective logging used on a tract of 23,000 acres of hardwoods owned by his company, between 1893 and 1905. In 1920 the company was able to resume cutting operations on the tract and to obtain from it the principal supply of timber for two band mills. John R. Thistlethwaite, of the Thistlethwaite Lumber Co., Opelousas, La., told of selective logging on 11,200 acres of hardwoods begun in 1907. The leaving of unmarketable trees, care in felling not to damage standing trees, and some fire protection were the measures taken. "As a result," said Mr. Thistlethwaite, "we have to-day a stand of valuable young timber that exceeds our expectation." A. L. Strauss, of the Malvern Lumber Co. of Arkansas, stated that his company is cutting to an 8-inch diameter in short-leaf pine where thinnings are needed, but are leaving trees as large as 20 inches where the stand is thin. The company has cut over one tract for the third time, getting more than 40 per cent of upper grades, which was better than the production from virgin timber. Improvements in highways and secondary roads and development of truck logging, according to Mr. Strauss, has made this method of logging practicable. Henry E. Hardtner again described his operation at Urania, La., and papers were presented by L. R. Wilcoxon of the Crossett Lumber Co., Crossett, Ark., and G. H.

Lentz, special investigator for the Louisiana division of forestry while on leave from the New York State College of Forestry, covering somewhat the same ground as their articles in this number of the *FOREST WORKER*. James Fowler of Soperton, Ga., in a paper on "Protecting small areas," stated that he has 10,000 acres of the finest young pine in the South as a result of protecting his land in cooperation with the Georgia Forest Service and the United States Forest Service. He spends 12 cents an acre for firebreaks and considers he is well repaid for what he has done. He has stocked some of his protected lands with Mexican quail and has "more birds than he knows what to do with." The cases presented on the floor and the view of the operations at Bogalusa altogether made an impressive showing for southern timber growers.

The program covered, in addition to the points already mentioned, forest fire protection, the farm woodland, forest utilization, and the protection of forest range. General addresses on the forestry situation in the South included speeches by B. F. Smith, president of the congress. Senator Ransdell, of Louisiana, and R. Y. Stuart, chief of the United States Forest Service. In the discussion of farm forestry emphasis was placed on the advantage to the farmer of utilizing his own labor in marketing his timber.

The president of the congress in his opening address expressed the belief that in spite of the fact that some of the important original objectives of the congress had been reached the most important field of work lay ahead. Resolutions passed by the congress brought this out in a striking manner, one of them calling upon the Congress of the United States and the governors and legislatures of the 16 Southern States to provide adequate legislative and financial support for public forestry work. This resolution stated that only one-third of the 214,000,000 acres of private and public forest lands in these States is at present receiving any systematic protection, that funds available are entirely inadequate to protect even the relatively small acreage included in systematic protection areas, and that the public has a large measure of responsibility in the economic development of the great forest resources of these States. Another resolution embodied a plan for enlarging the organization of the congress so that it might function between meetings through the establishment of committees or groups in each of the 16 States, such committees to be responsible for informing the congress as to progress being made and as to programs of development needed by the several States. This plan will, it is understood, be considered at an early meeting of the executive committee.

A resolution on forest taxation advocated legislation providing for a reasonable annual tax on the value of the land alone during the growth of timber; a yield or a severance tax on merchantable products when cut, not exceeding 6 to 10 per cent of stumpage values for average conditions; specific contracts with owners of cut-over lands devoted to reforestation whereby the

assessed value of the lands may be fixed for a period required to produce a crop of timber; and the amendment of State constitutions that include provisions preventing equitable readjustment of taxation on forest property.

Officers were elected for the coming year as follows: President, George T. Houston, George T. Houston Lumber Co., Vicksburg, Miss.; vice president, E. F. Allison, Allison Lumber Co., Bellamy, Ala.; secretary, R. S. Maddox, State forester of Tennessee; assistant secretary, H. B. Phillips, Hardwood Institute, Memphis, Tenn.; chairman of executive committee, Henry E. Hardtner, Urania, La. Memphis was chosen as the meeting place for the twelfth congress, to be held early in 1930.



A new commercial forestry enterprise is reported from Arkansas, where the Missouri Pacific Railroad has arranged with James D. Lacey & Co. to institute forestry management on about 100,000 acres of its timberlands in the region north of the Arkansas River, between Russellville and Fort Smith. A survey of the tract and an inventory of the stands are now being made by Lacey men. It is planned to coordinate the fire-protection work with that on the Ozark National Forest, the lands being contiguous.

Some difficulty is involved in the institution of forest management on the Missouri Pacific lands because the lands occupy alternate sections and because they have been badly burned and overcut in past years.

## National Park Legislation

An act of Congress approved by President Coolidge in the closing days of his administration created the Grand Teton National Park on lands lying west of Jackson Lake, Wyo., that were heretofore a part of the Teton National Forest. This area includes a portion of the Teton Range of mountains, which gives it a scenic value much superior to its possibilities for timber growing.

The appropriation act for the Department of the Interior for the fiscal year 1930 carries a clause authorizing condemnation of private lands within the national parks for purchase by the Government. (The authorization does not cover lands in Acadia, Glacier, Grand Canyon, Great Smoky, Hot Springs, Platt, or Yellowstone National Parks that are occupied by the owners and used exclusively for residence or religious purposes.) The act provides \$250,000 for this purpose, specifying that this money shall be expended only when matched by equal amounts contributed for the purpose from other sources.

Another recent act of Congress authorizes the Secretary of the Interior to investigate and report to Congress on the advisability of establishing a national park in southern Florida. Another authorizes the appointment of a Yellowstone Park boundary commission to revise the boundaries between the park and the adjacent national forests.

A bill that failed to receive the President's approval was that to create a national park in Arkansas on lands now included in the Ouachita National Forest.

## Foreign Notes

### Brazil Establishes Forest Service

Brazil is setting out to organize a Federal forest service, under the provisions of legislation that has been in existence for some years. In planning for the new organization the Brazilian Minister of Agriculture availed himself of the advice of William A. Orton, director of the Tropical Plant Research Foundation, Washington, D. C. In this connection Doctor Orton recently made a visit to Brazil.

The new service is to be headed by William Thomas Cox, for the past three years director of the Upper Mississippi River Wild Life and Fish Refuge of the United States Bureau of Biological Survey. Mr. Cox, a graduate of the University of Minnesota, had 7 years' experience with the United States Forest Service and was for 11 years State forester of Minnesota. Assisting him as associate forester will be Donald M. Matthews, professor of forest management in the School of Forestry and Conservation, University of Michigan.

Professor Matthews, a graduate of the University of Michigan, has had almost 20 years' experience in tropical forestry work, in the Philippines and British North Borneo. Three years ago, as forester for the Tropical Plant Research Foundation, he made an investigation of forestry problems of eastern and central Cuba. Under his present arrangement with the Brazilian Government he will devote six months' time to an intensive study of Brazilian forestry conditions while on leave from the University of Michigan. Mr. Cox expects to assume his new duties about July 1, and Professor Matthews will probably leave for Brazil early in August.

In discussing the importance of this step by Brazil Doctor Orton says:

Brazil is reported to have over a billion acres of timberland, 100,000,000 acres of which is said to be occupied by valuable pine. The Amazon Valley contains the greatest solid body of timber in the world, and the application of forestry principles to this great

region should have a profound effect on the timber markets of the world. In Brazil are over 3,000 distinct kinds of timber trees, and in the Amazon Valley alone over 2,000 have been reported. There are probably many more trees of unknown species which, when better known, will have great value and utility. Brazil is a country wealthy in very high-grade woods, and the first purpose of the forest service will be to put the forests of the country on a perpetually producing basis.

Brazil's present plans include sending students to the forest schools of the United States to be trained, under the supervision of the Tropical Plant Research Foundation, for forestry work in their native land.

### California Eucalypts and Pines for Planting in Turkey

Harold T. Pence, a graduate of the College of Agriculture, University of California, has written as follows of the problems he is now facing as director of agriculture for the American Mission at Aintab, Turkey:

The country has in large part been deforested within the last 50 years, as sheep and goats run at large over the hills and valleys, and, of course, the soil in many places is eroding very fast. Not only for this reason but also from the fuel standpoint, reforestation is of importance. We are starting a small nursery for ourselves, in which we shall start several species of pines (including western yellow), several species of oaks, manzanitas, laurel, and locust, as well as some native shrubs. I am looking for a quick-growing tree which will provide shade, windbreaks, and fairly hard wood for charcoal burning, and which may be used as forests upon the hills. We have this problem to face: the country is underlaid by rotten limestone, in most places less than 1 foot below the top of the soil, so it must have a tree that can grow on the surface from wide-spreading roots. This high bedrock has one advantage which is well worth considering—the stone is always moist. This fact seems to me to be the greatest factor in making dry farming possible on most of the land.

Seed of eucalypts and pines from California have been forwarded to Mr. Pence for trial plantings in Turkey.

### Treated Ties Give Good Service in India

Of 7,411 treated ties of chir (*Pinus longifolia*) laid in 1915 in the Lahore division of the North Western Railway, India, none had been replaced up to 1927, according to a report in the Indian Forester by W. A. Bailey, timber advisory officer of the Railway Board, Simla. The ties were treated in open tanks with a half-and-half mixture of creosote and "earth oil." The average life of an untreated chir tie, Mr. Bailey states, is only about 3 or 4 years. Inspections in 1927 showed that it had been necessary to replace 7 per cent of the 34,988 similarly treated ties laid in 1916 in the Lahore, Ferozepore, Multan, and Delhi divisions; 0.7 per cent of the 3,410 laid in 1917 in the Delhi and Quetta

divisions; and 6 per cent of the 104,359 laid in 1918 in the Delhi, Rawalpindi, and Quetta divisions.

### Irish Free State Regulates Timber Cutting on Private Land

Under a forestry law enacted in 1928 by the Irish Free State, landowners intending to cut down or uproot any trees more than 10 years old, other than fruit trees or osiers, are required to give the Government 21 days' written notice of their intention. The minimum penalty established for failure to give such notice is £5 for every tree cut down or uprooted; in cases in which the offense results from a bona fide mistake of fact the total penalty is limited to £100. The Minister for Agriculture is authorized to prohibit the felling or uprooting, and violation of a prohibition order is made punishable by a fine of not more than £5 per tree. A prohibition order can not apply to trees that are to be transplanted, trees in county boroughs or urban county districts, or trees within 100 feet of a building. Exemption is granted also in favor of fellings for the purpose of obtaining timber for the construction or repair of buildings, fences, or other structures on the holdings on which the trees stand or on neighboring holdings, or for the purpose of obtaining domestic fuel; this exemption is limited, however, to cases in which a tree is "not necessary for the ornament or protection of the holding on which it stands." Further exemptions apply in cases in which the revenue from fellings is obligated under the terms of loans for the purchase of the land, or of mortgages on the land, antedating the passage of the law.

An order prohibiting felling must be accompanied by a written statement of the reasons for the prohibition.

In granting a felling license the Minister for Agriculture may require that within a year or shorter period after the removal of a tree the tree be replaced by the planting of one or more trees of a specified kind.

When the minister makes a prohibition order with the view of preserving scenic beauty he may award compensation, if he is satisfied of the good faith of the intention to fell.

The minister may grant any person a general permit for thinning or clearing on any specified land either with a view to replanting or "in accordance with the general practice of good forestry."

The law requires that when anyone other than the owner of a woodland intends to burn shrubs growing within 1 mile of the woodland he shall give seven days' written notice of his intention both to civil authorities and to the owner of the woodland. If such notice is not given or if the woodland owner serves a counter notice objecting to the proposed burning as likely to cause damage to the woodland, the person burning the brush becomes responsible for any injury so caused and is subject to recovery of damages.

## Canadian Forest Fires in 1928

Canada's losses from forest fires in 1928 are estimated at \$1,328,950, as compared with an average of \$4,463,581 for the 5-year period 1924-1928. During the year 4,259 fires occurred in the Dominion, burning over 1,347,170 acres.

In New Brunswick and Nova Scotia 6,451 acres were burned over by 234 fires, with losses estimated at \$3,422, the lowest on record for the two Provinces. One factor in the reduction of losses was the wetness of the season. Quebec also made a low record. In Ontario nearly three times as much land was burned over as in the previous year; 86 per cent of the losses occurred in the Patricia district in the northwestern part of the Province, beyond the boundaries of the

aerial patrol system. For Quebec and Ontario the total number of fires was 831 and the acreage burned was 106,916. The Prairie Provinces, with an exceptional fire season continuing from April to the end of December, had 1,050 fires burning over 1,109,881 acres and resulting in a loss of timber and young growth estimated at \$780,521. In British Columbia 2,144 fires were reported, of which 80 per cent were extinguished in the incipient stage. Here 123,912 acres were burned over with a loss estimated at \$271,185.



A nation-wide inventory of Canada's forest resources is planned by Minister of the Interior Stewart. The premier of each of the Provinces has been invited to cooperate.

## Personals

Fred W. Morrell has been appointed chief of the branch of public relations of the United States Forest Service, succeeding to the position left vacant by the death of J. Girvin Peters in October of last year. Mr. Morrell, who is a native of Nebraska and a forestry graduate of the University of Nebraska, entered the Forest Service in 1906. He served as assistant district forester in charge of operation in the Rocky Mountain National Forest District for 12 years, and since 1920 has been district forester of the Northern National Forest District with headquarters at Missoula, Mont.

Evan W. Kelley, since 1925 chief of the Eastern National Forest District, succeeds to Mr. Morrell's post in Missoula. Mr. Kelley has been a member of the Forest Service since 1906, holding a number of administrative positions principally in California. During the World War he served in France for two years with the Forestry Regiment, being commissioned a major.

Joseph C. Kircher has taken over Mr. Kelley's former duties as head of the Eastern National Forest District organization, leaving the central office of the Forest Service after serving there for four years as inspector in the branches of operation and forest management. Mr. Kircher, a graduate of the Yale Forest School, has been a member of the Forest Service since 1909. His earlier experience was in technical and administrative work in the Southwestern National Forest District, with headquarters at Albuquerque. In 1923 he was sent to Rio de Janeiro in charge of the exhibit of the United States Department of Agriculture at the Brazilian Exposition. On the basis of information collected during his visit to Brazil he later wrote a bulletin on the parana pine lumber industry of that country, which was published by the Department of Commerce.

John S. Boyce, director of the Northeastern Forest Experiment Station, will join the faculty of the Yale Forest School this fall as professor of forest pathology. Before taking his present position in the early part of 1928 Doctor Boyce was for eight years head of the Portland, Oreg., office of forest pathology, Bureau of Plant Industry.

Wade H. Phillips has retired as director of the North Carolina Department of Conservation and Development, after serving in that office for three years. He returns to the practice of law. His successor is J. W. Harrelson, formerly professor of mathematics of the North Carolina State College. J. K. Dixon has likewise retired as assistant director of the department, and is succeeded by J. S. Hargett.

William O. Edmondson has been appointed extension forester for Wyoming. Mr. Edmondson served during the past year as agricultural agent in Wills County, Colo.

Emanuel Fritz, professor of wood technology and lumbering in the University of California, and A. B. Recknagel, professor of wood technology, forest utilization, and forest management in Cornell University, are the principals in an exchange of professors agreed upon by the two universities. Professor Recknagel will teach at the University of California during the fall semester of 1929, and Professor Fritz will teach at Cornell during the spring semester of 1930.

A. R. Watzek, of Portland, Oreg., and Sol Reed, of Shelton, Wash., have been appointed members of the Pacific Northwest Forest Research Advisory Council, succeeding Russell Hawkins and Frank H. Lamb, whose terms have expired.

Crosby A. Hoar, forest inspector in charge of State cooperation in fire control and distribution of forest planting stock in the Rocky Mountain National Forest District, has been made assistant district forester in charge of that work in the newly organized Lake States National Forest District. W. F. Ramsdell, assistant in the office of forest management, North Pacific National Forest District, has been transferred to the new district as assistant district forester in charge of forest management and lands.

The Central States Forest Research Advisory Council recently came into existence with a membership of 21 appointed by the Secretary of Agriculture. The council will advise the Department of Agriculture as to a forest-research program to be followed by the department in Ohio, Indiana, Illinois, Kentucky, Tennessee, Iowa, Missouri, and northern Arkansas, and will work to stimulate and correlate forest research by different agencies in that territory. Its personnel is as follows: G. B. MacDonald, Iowa State College of Agriculture, Ames, Iowa; Frederick W. Dunlap, State forester, Columbia, Mo.; Stephen A. Forbes, chief, Natural History Survey of Illinois, Urbana, Ill.; Edmund Secrest, State forester, Wooster, Ohio; Ralph F. Wilcox, State forester, Indianapolis, Ind.; R. B. Miller, chief forester, Illinois Department of Conservation, Springfield, Ill.; Stanley Coulter, Indianapolis, Ind.; R. T. Houk, vice president, Meade Pulp & Paper Co., Dayton, Ohio; W. M. Stark, president, American Lumber & Lumber Co., Columbus, Ohio; E. N. Transeau, chairman, botany department, Ohio State University, Columbus, Ohio; R. S. Maddox, State forester, Knoxville, Tenn.; W. E. Jackson, jr., State forester, Frankfort, Ky.; William T. Culver, manager, James D. Lacey Co., Chicago, Ill.; Charles H. Barnaby, Greencastle, Ind.; Joseph E. Pfeleger, Enterprise Manufacturing Co., Akron, Ohio; C. Vivian Anderson, Cincinnati, Ohio; Charles E. Hearst, Des Moines, Iowa; C. A. Dyer, Columbus, Ohio; Paul C. Stark, Louisiana, Mo.; Earl C. Smith, Chicago, Ill.; and R. W. Brown, president, Missouri Farm Bureau, Carrollton, Mo.

James D. Kennedy, who has been assistant State leader of blister-rust control in New York, is now a member of the extension staff of the New York State College of Forestry.

L. J. Leffelman has left the Ohio State Forestry Department, with which he was connected as assistant forester in charge of research, to go into private work as a consulting forester. He has taken charge of a commercial forestry project on the Hillcrest Plantation estate of Walter C. White at Sumter, S. C. Here he intends to institute forestry management on native woodlands including 6,000 acres of swamp hardwood land now being cut over, reforest from 5,000 to 6,000 acres of land consisting principally of old fields, and raise some surplus planting stock for sale. This spring he has planted 175 acres of the estate with long-leaf pine seedlings and has begun work on a nursery.

George H. Cecil has resigned as supervisor of the Angeles National Forest, Calif., to become executive secretary of the Los Angeles County Conservation Association, affiliated with the Los Angeles Chamber of Commerce. Mr. Cecil's membership in the Forest Service dates from 1903; before taking his recent post in California he had been stationed at the central office of the service in Washington, D. C., and at Portland, Oreg.

William V. Mendenhall succeeds Mr. Cecil, and is succeeded as supervisor of the Santa Barbara National Forest, Calif., by S. A. Nash-Boulden, supervisor of the San Bernardino National Forest, Calif. J. E. Elliott succeeds Mr. Nash-Boulden, leaving the supervisorship of the Cleveland National Forest, Calif., to L. H. Anderson, heretofore assistant supervisor of the Angeles.

Alvin G. Whitney has resigned his assistant professorship in the School of Forestry and Conservation, University of Michigan, to accept the position of assistant director and secretary of the New York State Museum, at Albany, N. Y. Before going to the Michigan school in 1927 to organize its work in forest zoology Mr. Whitney was connected with the New York State College of Forestry as professor of forest zoology and assistant director of the Roosevelt Wildlife Forest Experiment Station. His work at the New York State Museum will be chiefly administrative, including collaboration in planning and directing field research.

Officers recently elected by the National Shade Tree Conference are, president, H. H. York, forest pathologist of the New York Conservation Commission; vice president, A. F. Burgess, in charge of the gipsy-moth laboratory at Melrose Highlands, Mass.; secretary-treasurer, Rush P. Marshall, in charge of the Federal forest-disease laboratory at Yale University.

Secretary of Commerce R. P. Lamont has accepted the chairmanship of the National Committee on Wood Utilization.

J. B. White, Montreal lumberman, is the new president of the Canadian Forestry Association. During the war Mr. White commanded the Canadian Forestry Corps in France and became deputy director of forestry with the Imperial Armies with the rank of brigadier general. He is an officer of the Canadian International Paper Co. and several other lumber and power concerns. In 1928 he was president of the Canadian Lumbermen's Association.

Charles Wilkinson, for three years a member of the executive staff of the association, has been appointed its manager for British Columbia.

John D. Sutherland, assistant forestry commissioner for Scotland, has been elected president of the Society of Foresters of Great Britain. R. S. Troup, Oxford, is vice president, and R. Angus Galloway, Edinburgh, is secretary and treasurer.

John H. Hatton, chief of range management in the Rocky Mountain National Forest District, has been appointed editor in charge of the wild-life and recreation section of the Journal of Forestry.

George M. Gowen has been promoted from the position of assistant supervisor of the Lassen National Forest, Calif., to that of supervisor of the Trinity National Forest in the same State. Frank Price, whom he succeeds, has been transferred to the supervisorship of the California National Forest.

Officers elected by the Western Forestry and Conservation Association at its annual meeting in Seattle March 18-20 are, president, A. W. Laird, Potlatch, Idaho; vice presidents, W. C. Lubrecht (for Montana), C. A. Barton (for Idaho), C. B. Sanderson (for Washington), George B. McLeod (for Oregon), and C. R. Johnson (for California); secretary-treasurer, C. S. Chapman.

H. J. Eberly, for five years chief of the division of forest protection of the Texas Forest Service, has resigned to accept a position with the Oregon State Board of Forestry. His work in Oregon will be connected with the administration of the forest taxation law recently enacted there.

J. E. Lockwood, of the Hercules Powder Co., is the newly elected president of the Pine Institute of America. Carl Speh is secretary and S. H. Berg, of the Peninsular Naval Stores Co., is chairman in charge of local arrangements for the 1930 annual meeting of the institute, which is to be held February 20-22 in Jacksonville, Fla.

C. Stowell Smith, who for the past 12 years has been secretary of the California White and Sugar Pine Manufacturers Association, has resigned that position and is now working in Washington, D.C., for the National Lumber Manufacturers Association.

## Bibliography

### Hanzlik's "Trees and Forests of Western United States"

By W. A. DAYTON, United States Forest Service

Under the title "Trees and Forests of Western United States" there has recently appeared a 128-page book by Edward J. Hanzlik, of the North Pacific district of the United States Forest Service, which has its headquarters at Portland, Oreg. The book is prefaced with a biographical note by John D. Guthrie, chief of public relations of the same district.

In his foreword Mr. Hanzlik states that the book is based upon a series of monographs on western commercial trees which he has published in the *Four L Lumber News* of Portland, Oreg., the journal of the Loyal Legion of Loggers and Lumbermen. The book consists of eight chapters: Trees and their growth, classification of plants, the western forest regions, forest statistics, the western national forests, tree descriptions, Pacific coast hardwoods, and uses of western woods. Nearly two-thirds of its bulk is made up by the sixth chapter, "Tree descriptions," which contains notes on 25 important commercial conifers of the West. These notes are well digested and cover in small compass a surprising amount of information on the species concerned, including English and botanical names, area and location of commercial stands, size, history, range and occurrence, forest type, associates, growth conditions, reproduction, properties and uses of wood, and enemies—especially fungi, insects, and fire. The seventh chapter, "Pacific coast hardwoods," gives similar information for five commercial broad-leaved species. There is a type map of the region covered, a key to the genera and a key to the species of conifers

represented, 14 yield and volume tables, 5 other statistical tables, and a good index. The work is well illustrated with 19 botanical drawings and photographs, 12 drawings and photographs of wood, and 12 other half tones.

The usage of Sudworth's Check List is carefully followed in both English and Latin nomenclature, save only that *Rhamnus purshiana* is called "cascara sagrada" instead of the "cascara" of the Check List or the "cascara buckthorn" of Standardized Plant Names. "Cascara sagrada" is really the name of the bark of this tree rather than of the tree itself; "cascara," which is the Spanish word for "bark" and is used in combination in the nomenclature of many different medicinal and other barks, is hardly a plant name.

Mr. Hanzlik has done his work so well that there is little about it to criticize. Chief emphasis, naturally enough, has been placed on the timber species of the Pacific States and Idaho; but the commercial species of all the 11 far western States are satisfactorily covered. Possibly if the title were changed to "Commercial Trees and Forests of Western United States" it would be more exact. A few typographical errors have crept in, notably in the spelling of both common and botanical names of Engelmann spruce in headings on pages 80 and 81. The book has been prepared more as a manual for the lumberman, the wood user, the forest administrator, and the general public than as a college textbook; but its scientific basis is sound, it is eminently readable, and it will make a useful and valuable reference work for research as well as for essentially practical purposes.

The book was printed by the Dunham Printing Co., Portland, Oreg.



## Economic Aspects of Forest Destruction in Northern Michigan

By L. C. EVERARD, United States Forest Service

Forest destruction has taken a course in Michigan that is very similar to its course in other parts of the country. The State was chosen by the United States Forest Service for a study of economic effects chiefly because it is one of the States in which the more serious forms of destruction had the earliest start and in which there has been time for the effects to become evident; also because it affords one of the best examples of great stretches of highly productive forest converted into idle land. In reporting the results of the study Sparhawk and Brush, the authors of *The Economic Aspects of Forest Destruction in Northern Michigan*, just issued by the United States Department of Agriculture as Technical Bulletin 92, have used with unusual skill and effectiveness two methods not easily combined—specific example and statistical comparison.

Not only is the bulletin an outstanding contribution from the scientific and historical point of view, but parts of it are especially good reading because of the vigorous and suggestive style in which they are written and the element of human interest which they contain. For instance " \* \* \* in 1921 all that remained of Deward (a lumber town established in 1901 with 70,000 acres of tributary timber) was a portion of a broken-down engine house and chimney of the sawmill, a few unpainted shacks, a railroad station, a church, and a boarded-up railroad hotel. The dozen or so families that remained were mostly connected with the railroad, which still ran one train a day in and out, though the settlers were then worrying lest the service cease altogether and lest this compel them to haul in their supplies over 12 or 15 miles of road that is almost impassable during part of the year. The railroad, which a few years before carried 80 carloads of forest products daily, in 1921 occasionally hauled as much as 2 cars of lumber at one time. There were infrequent oases of cleared land in the desert of stumps stretching away toward the horizon, but the chief topics of conversation among the people along the line were the chances of finding work in the city and the question of where to go." Another instance is, "The depletion of local forests has been especially hard on the numerous small factories making turned goods. \* \* \* Thirty years ago another village in the same section [northwestern Michigan] had large handle and cooperage factories and a sawmill. Work was plentiful, the streets were crowded on Saturday nights, and tradesmen prospered. Now the timber is gone, the people are scattered, and business is poor." A sentence describing the end of a railroad that depended chiefly on the timber for its revenue is sufficient to give an idea of how this subject is handled through specific example: "The track was finally taken up, leaving several hundred carloads of potatoes, hay, grain, wood, and other products stranded along the line, and leaving many square miles of country without railroad service."

The statistical material is handled in such a way as to give a comprehensive picture of what the timber meant to the State and what its removal entailed. Carefully classified figures, the significance of which is brought out and made clear by numerous charts, are the basis for discussion of the effects of the removal of the forest on land use, community development, agriculture, railroads, forest and allied industries, schools and roads, taxation, interest rates, employment opportunities, and social conditions. In addition the bulletin contains a statement in regard to the original timber resources of the State, a history of the exploitation of those resources and of the settlement following lumbering, a study of the problem of idle land that now confronts the State, and a suggested forestry program.

The suggested forestry program is supplementary to what has already been done in Michigan, which is a good deal. State forests in Michigan now cover about 361,000 acres, and State and private expenditures for forest fire protection in 1927 were more than \$335,000. Recommendations made as a result of the study are that the State's program include an enlarged system of State forests, promotion of forestry on the part of local public bodies (counties, towns, and cities), encouragement and assistance to private owners, provision for adequate fire protection for all forest lands, and a State planning commission that would include experts on forestry and land utilization. It is recommended also that the Federal forest land holdings in the State be consolidated and somewhat enlarged. The authors estimate that if the forest land of Michigan could be made fully productive it would give permanent employment to at least 100,000 persons and, counting their families, would support about 450,000 persons directly; indirectly it would support numerous additional people engaged in various trades and professions. "All told," the bulletin states, "it may be conservatively estimated that, with complete utilization, the forest land of Michigan would directly or indirectly support at least an additional million people."

The bulletin may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 25 cents a copy.



A number of copies of English résumés of the following studies are available for distribution from the Office of Forest Experiment Stations, United States Forest Service, Washington, D. C.: *The Significance of the Nitrogen Mobilization in the Raw Humus Layer for the Early Development of Pine and Spruce Plants*, by Henrik Hesselman, and *The Development of Mycorrhiza on Pine Seedlings in Various Forms of Raw Humus*, by Elias Melin. These are translations by Paul W. Stickel of the German résumés of the two studies that appeared in *Meddelanden Från Statens Skögsförsöksanstalt*, Häfte 23, N:o 6-7, 1927.



## Water Powers of California

By J. C. DORT, United States Forest Service

In his recent report to the Federal Power Commission Frank E. Bonner, district engineer of the United States Forest Service in California, presents a most comprehensive summary of the water-power resources of California, both developed and potential.

The bulletin begins with a discussion of physical conditions existing in the State of California, in which Mr. Bonner comments on the little-known fact that over practically two-thirds of the State's surface the topography is rugged, broken, and mountainous. He then develops the principal characteristics of rainfall and run-off in California, describing their variations in different parts of the State. Following this is a brief description, with tables, of existing water-power developments; a discussion of the market and of load characteristics; and an estimate of the State's potential water-power resources. The bulk of the report is given over to a full description of the resources of each drainage basin. Some very illuminating charts are presented showing how population, consumption per capita in kilowatt-hours, and electric load have increased in the past 28 years, with an extension of the curves forecasting future increases up to 1960. There are separate charts for northern and southern California and one for the entire State.

Among other things the author points out the significant fact that there is a great concentration of water powers in the northern part of California, but in the southern part of the State a lack of available resources to meet future requirements of the vast local market. For the additional hydroelectric power that it will need in the future it appears that southern California will have to look to the Colorado River. This river, with a potential average output of about 1,200,000 kilowatts, apparently is capable of taking care of the southern California demand for the next 50 or 75 years.

While highly statistical, Mr. Bonner's bulletin is written in an interesting style. It is illustrated with cuts of some of the more important power developments, maps of river basins, and diagrammatic profiles showing present and proposed installations.

This report is a natural follow-up of *Hydroelectric Power Systems in California*, by F. H. Fowler, former district engineer of the United States Forest Service in California, which was published in 1923 by the United States Geological Survey as Water-Supply Paper 493. The earlier publication recorded the beginnings and early history of hydroelectric development in California; this one brings up to date the summary of developed water powers, and describes the potential resources of the State.

Copies of this report may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 50 cents each.

## A Comprehensive Volume on Range Livestock Husbandry

By R. R. HILL, United States Forest Service

*Livestock Husbandry on Range and Pasture*,<sup>1</sup> by Arthur W. Sampson, is a companion book to the same author's *Range and Pasture Management* and his *Native American Forage Plants*. The subject matter and scope of this latest volume are summarized in the preface as—

the most approved methods of livestock handling on different types of forage; the suitability of breeds of stock to climate and food plants; the habits and practical control of predatory animals and forage-destroying rodents; and the relation of livestock grazing to the propagation, preservation, and management of game animals.

The book is intended primarily as a textbook for students in range management; but the author expected that it would serve also to increase the knowledge of stockmen concerning the management of their herds, and their interest in improving range practices.

Doctor Sampson's endeavor in preparing this volume has been not so much to present original material as to provide a convenient digest of useful information already available. The topics discussed include the following: History of the livestock industry in the United States; meat consumption and prospective meat supply; development of the principal breeds of cattle and sheep; methods of improving the grades of livestock; chief characteristics of cattle and sheep affecting their adaptability to range and farm conditions; guides for the proper seasonal handling of livestock; schedule of items in handling sheep throughout the year on range and farm, with a brief description of the best practices, and discussion of diseases of sheep and goats and their control; corresponding topics regarding the raising and management of cattle; cost-keeping and budgeting in livestock production (forms are described that should be very serviceable to the average stockman in keeping records of his expenses and income); characteristics and means of control of the principal animals that prey upon livestock and of rodents that destroy forage crops; wild animal life and recreation areas, and their relation to livestock production; and reindeer production as a range industry.

Obviously such a large group of subjects could not be treated in detail in one volume of 400 pages; but the high lights of information regarding each subject are adequately presented in popular style. The book constitutes a well-rounded treatise. This first attempt to bring together in a single volume the principal information available regarding livestock husbandry on ranches and farms in the United States, made by an author who has devoted many years to the study

<sup>1</sup> John Wiley & Sons (Inc.), New York.

of range and livestock management and who is highly familiar with the literature on the subject, forms a very valuable contribution to the literature suited for use in forest schools and in agricultural libraries. The value of the volume as a textbook is considerably enhanced by the fact that at the end of each chapter the author has supplied a complete bibliography and a set of questions and topics for discussion.

## A New Manual of Minnesota Woody Plants

By W. A. DAYTON, United States Forest Service

Seventeen years ago the University of Minnesota published, as the ninth report of its botanical survey, a 314-page manual entitled "Minnesota Trees and Shrubs," by Profs. Frederic E. Clements, Carl Otto Rosendahl, and Frederic K. Butters. The two junior authors have recently revised, enlarged, rearranged, and to a considerable extent rewritten this work. As the result there has now been published under the title "Trees and Shrubs of Minnesota" a State manual of woody plants that is one of the finest both in contents and in appearance. This sexto volume of 386 pages, substantially bound in forest-green cloth, with attractive typography and paper, has a preface by Prof. J. Arthur Harris; an introduction covering terminology, use of keys, pronunciation, and an outline of the forest ecology of the State; keys to families and genera; a glossary; and an index to both Latin and English names. The book is very profusely illustrated, with a vegetational distribution map of the State, line drawings definitive of 42 botanical terms, 15 half tones of living trees and shrubs, and 271 drawings of tree and shrub species and varieties.

The body of the book, pages 27-365, consists of family and generic descriptions, with specific descriptions of monotypic genera, keys to species and varieties, and distributional, phenological, and economic notes on 47 families, 107 genera, 324 species, 40 varieties, 14 forms, and 18 hybrids of native or introduced trees, shrubs, and woody vines occurring in Minnesota. Two hybrid cherry species are described as new and three new varietal combinations are published, two in *Rosa* and one in *Rubus*.

It is gratifying to note that in this new work bibliographical citations are given and standard abbreviations are used for authors' names. The Vienna Code of nomenclature is employed, which results in the remanding to synonymy of a few earlier names to which users of the American Code, such as the Federal Forest Service personnel, are accustomed; thus *Shepherdia* is substituted for the older *Lepargyrea*. In the main, the botanical treatment is eminently conservative; in a few cases, however, the treatment seems not altogether harmonious. For example, separating the junipers into two genera, *Juniperus* and *Sabina*, seems hardly consistent with merging chokecherries, cherries, plums,

and flowering almonds in one genus, *Prunus*, or uniting blueberries, whortleberries, and cranberries and their immediate allies in a single genus, *Vaccinium*. In view of the generally recognized variability in Virginia creeper (*Parthenocissus quinquefolia*), holding the rather feebly separable *P. vitacea* as a distinct species does not seem to be quite on all fours with reducing *Lonicera glaucescens* to varietal status under *L. dioica*. The two genera of *Myricaceae* are keyed apart (p. 86) solely on leaf characters; while these distinctions no doubt are the most obvious ones, is not the omission in this key of all reference to fruit and floral characters apt to give the inexperienced student the unfortunate impression that genera are sometimes delimited on the basis of the cutting of leaf margins?

It is pleasing to note the attention that has been paid in this volume to English plant names. Would it not, however, have been desirable to effect a closer correlation of this nomenclature with Standardized Plant Names and Sudworth's Check List? It seems to this reviewer that the authors of *Trees and Shrubs of Minnesota* might, in general, have profited by adopting the theory of Standardized Plant Names; witness, for example, the superiority in conciseness, form, and consistency of "peachleaf (versus "peach-leaved") willow" and "bigtooth (versus "large-toothed") aspen." Since the name salmonberry is so generally and uniformly applied to the Northwestern *Rubus spectabilis*, it seems that a protest may legitimately be made against the adoption of that name for thimbleberry, or whiteflowering raspberry (*Rubus parviflorus*).

An interesting and useful part of this book is the explanation of the Latin generic and specific names. In general these explanations are accurate and satisfactory; a few of them might be improved upon. The adjective "glabra" (under *Aesculus* and *Rhus*) is defined as "smooth"; it does mean smooth, but in the sense of "hairless," and a better definition is "bald" or "hairless"; a leaf may be glabrous and at the same time rough. "Strobilus, the Latin name of some tree," is the explanation given on page 43 of the specific name of the northern white pine; "strobilus" is the classical Latin (Greek, *στρόβιλος*) word for pine cone, and is derived from a stem signifying "spirally whorled," whence there is an easy and obvious transition to the Late Latin word "strobilus" first for pine tree and then specifically for the northern white pine of eastern North America. "Grossularia" (p. 149) is said to mean "like a small unripe fig"; a more precise etymology would seem to be that it is a Late Latin term for the gooseberry (from "grossula," Middle Latin for "gooseberry," cognate with French "groseillier"). In giving the name of the smoketree (*Cotinus coggygria*), on page 251, it is stated that the specific name is "unexplained"; the authors apparently have overlooked the fact that Pliny is thought to have meant the smoketree when he wrote of a dye tree called "coggygia" (variantly "coccygia" and "coccygia":

Greek *κοκκυλία*) native in the Apennine Mountains. "Negundo" (p. 266) is said to be "of uncertain derivation"; it is a Malayan name for the box elder. The specific name "polifolia" (p. 309) is defined as "smooth-leaved"; the best authorities seem to be agreed that this familiar specific name—which, it will be noted, is applied only to shrubs or other plants that have the under leaf surfaces conspicuously whitened or glaucous—means "white (or glaucous) leaved" and perhaps also contains an allusion to an old name for rosemary, a plant the leaves of which are whitened beneath. "Opulus" (p. 348) is said to be a "classical Latin name for a tree"; this name, cognate with French "obier," is a generic name in Tournefort for the European cranberry bush (*Viburnum opulus*)—which has maple-like foliage—and was used by Pliny for a species of maple. The authors define the Greek prefix macro- as "large," when its actual and primary meaning is "long"; however, scientists have persisted so long in the misuse of macro- for mega- (apparently under the misapprehension that macro- is the opposite of micro-) that this comment may have no practical significance.

On page 5 the two right-hand illustrations ("4") under the heading "Lobed simple leaves" seem to be compound leaves. The specific name in "*Picea mariana*" (p. 37) is explained as referring to Maryland, "where, however," the authors add, "this tree does not occur"; actually, black spruce occurs in the Allegheny Mountains as far south as North Carolina and is common in parts of western Maryland. When the name of cultivated jetbead (p. 169) was corrected from *Rhodotypos tetrapetala* to *R. kerrioides* (N. B. the "r" in *kerrioides* is doubled) there was a failure to correct the definition of the specific name. In general, the proof reading of the book has been carefully done; notable errors appear in the Engelmann spruce paragraph (p. 39), where Engelmann's name is misspelled three times, in the spelling of *Amelanchier bartramiana* (p. 219), and in the use of the English "Tamarisk" (vice Latin "*Tamarix*") on p. 286.

This fine new volume is published by the University of Minnesota Press at Minneapolis.

## Slide and Film Strip Series on Soil Erosion

A series of 95 lantern slides supplementing Department of Agriculture Circular 33, "Soil Erosion, A National Menace," has been prepared by the Extension Service of the department in cooperation with the Bureau of Chemistry and Soils. Lecture notes to accompany the slides have been prepared by Hugh H. Bennett, soil scientist. The series is available for loan both on glass slides, many of which are colored, and on uncolored film strip. Requests for loans of the set should be addressed to the Office of Cooperative Extension Work, Department of Agriculture, Washington, D. C.

## State Forester Reports on Forestry Work in Montana

Montana ranks fifth among the States in area of State-owned timberland, State Forester Rutledge Parker asserts in his report for the biennium ending June 30, 1928. The State's timberland property, acquired under Federal land grants, amounts to 500,000 acres. Of this about 300,000 acres is now occupied by merchantable stands of saw timber estimated to total two and one-half billion board feet, and about 75,000 acres has been cut over during the past 35 years. The remainder consists of burned-over areas and alpine protection forests.

During the past eight years timber cutting on Montana State forests has been restricted to trees above 14 inches in diameter at breastheight in the case of larch and to trees above 16 inches in breastheight diameter in the case of western yellow pine. Mr. Parker believes that this cutting system, and conservative slash disposal, will result in an average crop period of 80 years with a yield equivalent to the average now obtaining in virgin stands.

Thus far the State forest department has made no effort to limit the amount of timber cut on the State forests; but for the past five years, the State forester points out, the average cut of green timber has been almost identical with the expected sustained yield. The absence of any limitation is due to the fact that as a rule the State timber is mixed with private holdings, making up only a small part of the stumpage in any logging unit. The only practical plan for harvesting State timber so situated is to have it cut by private operators when they have installed their logging improvements and are cutting the adjoining private timber. Under these conditions the demand must fix the limit of the amount to be cut. Furthermore, the timber on many of the State areas is now overmature. In addition, Mr. Parker observes, the lumber market is depressed at the present time and it is not the intention of the forestry department to force its product upon an already glutted market. The State, unlike the private owner, since it pays no taxes can afford to await higher stumpage prices.

Fire protection of the State forests is for the most part handled through cooperative arrangement with private forestry associations and with the United States Forest Service and the National Park Service. The cost of protection by the private associations averages 3 cents per acre per year.

Livestock grazing is an important and growing business on the Montana State forests. The fees now received from western yellow pine lands are sufficient to pay almost half the costs of fire protection on the State forests, and Mr. Parker expects that they will eventually equal these costs.

Practically all the forest lands in western Montana are now protected from fire. Most of the owners of

small tracts who had not sought such protection prior to 1927 through recognition of its benefits have become members of protective associations since the passage in that year of a law holding the owner of timberland responsible for the control of any fire in forest material existing on or spreading from his property unless the property is listed with a recognized protective agency.

The present tendency among loggers in Montana appears to be to burn too much rather than too little slash, Mr. Parker states in commenting on the operation of the slash-disposal provisions of the law of 1927. This law, replacing a law of 1919 under which it was required that all brush or slash left from timber cutting be burned or otherwise disposed of within a year from the date of cutting, requires that fire hazard to the property of others created by slashings shall be removed by partial or complete disposal of the slashings, or by other procedure, to the extent and in the manner required by the State forester, setting 15 cents per 1,000 board feet cut as the maximum expenditure that may be so required. Mr. Parker explains that under this law he expects, on the average, disposal of the slash on about one-third of the area cut over. It is intended and required that the brush be disposed of along all roads and fishing streams and at other points where fire lines can be established most economically and advantageously. The object is to leave no slash area larger than 100 acres without a fire-control boundary.

## Digest of State Forest Tax Laws

The Forest Taxation Inquiry of the United States Forest Service has just released as a progress report dated April 15, 1929, a multigraphed digest of all the State laws relating to methods of taxing forest land that differ from those followed in taxing other real estate. Accompanying the digest is a short historical summary of forest tax legislation and a tabular comparison of some of the important provisions of the different laws.

The historical summary sketches briefly the movement toward forest tax relief in the form of exemptions, bounties, rebates, and yield taxes that bore its first fruit with the enactment of an exemption law by Nebraska in 1866. The yield-tax plan of taxing forests was not enacted into law until some time later, the first law embodying such a plan being adopted by Michigan in 1911. Today this movement is represented by 16 exemption, bounty, and rebate laws and 14 yield-tax laws on the statute books of 24 States.

The digest covers these laws and, in addition, the amendment to the constitution of California that exempts all immature forest growth from the property tax. To facilitate the study of the laws of the different States a uniform list of topics have been treated in uniform order, so far as applicable. Marginal numbers in the digest refer to these topics, which are as follows: I, special classification; II, modification of the general property tax; III, new specific or other special property

tax; IV, yield tax; V, relief from other taxes; VI, contribution of the State to the towns and counties; VII, classification qualifications; VIII, general penalty provisions; IX, contract; X, amendments; and XI, special fire-protection provisions. The tabular summary, which makes it possible to compare certain features of all the laws at a glance, covers briefly topics II to VII, IX, and XI.

Copies of this report may be obtained by writing to the Director, Forest Taxation Inquiry, 360 Prospect Street, New Haven, Conn.

## Science Popularized by a Scientist

(From a review by RAPHAEL ZON, United States Forest Service)

The literature devoted to the popularization or, as Robinson would put it, humanization of science has been enriched within the last few years by several notable contributions such as Will Durant's *Story of Philosophy*, Paul de Kruif's *Microbe Hunters*, and more recently *Hunger Fighters*,<sup>2</sup> also by de Kruif.

In Europe the best popularizers of science are the scientists themselves—men like the great physicist Tyndall, Huxley, and Haeckel. The clearest and simplest presentation of the theory of evolution is found in Darwin's own 2-volume work, *The Origin of Species*. Our scientists for some reason have usually considered it beneath their dignity to write about their findings in a style that would interest the average reader. Therefore books like *Hunger Fighters*, by Paul de Kruif, himself a scientist, mark a new departure in our efforts to popularize science. We hope that Doctor de Kruif's example may be followed by a number of his colleagues.

The book is not merely a story of the scientific discoveries that led to increasing the North American food supply. It gives a series of intimate biographies of men who through their work contributed immensely to the wealth and well-being of this country, yet who themselves remained in obscurity. Practically all the men described are of de Kruif's own generation. Many of them are still living, and many have been personally known to the author.

Although not a scientific treatise, *Hunger Fighters* will be very helpful to science in general. It does what many an official scientific publication and many an argument before a congressional committee on appropriations has failed to do—points out the tremendous social value of science. Convincingly and dramatically, de Kruif shows how scientific research enters into the life of the community and how intimately it affects the sufferings, struggles, well-being, and happiness of the people. The book should afford a great stimulus to the research men themselves, and especially to those working in forestry. What higher aspiration can foresters have than to emulate in their own field what the hunger fighters have done in the field of scientific agriculture?

<sup>2</sup> Harcourt, Brace & Co., New York.

## Recent Books and Pamphlets

- American Tree Association: Forestry almanac, 1929. 390 pp. illus., maps. Washington, D. C., 1929.
- Arnold, L. J.: The accounting for southern pine. 31 pp. (Yale Forest School lumber industry series no. 9.) New Haven, 1929.
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- Canadian Bureau of Statistics: The pulp and paper industry, 1927. 102 pp. diags. Ottawa, 1929.
- Cheyney, E. G., and Levin, O. R.: Forestry in Minnesota. 55 pp. illus., map. Minnesota Forest Service, St. Paul, 1929.
- Conzet, G. M.: State lands: their agricultural and forest possibilities. 51 pp. maps. Minnesota Conservation Commission, St. Paul, 1928.
- Gevorkiantz, S. R., and Hosley, N. W.: Form and development of white pine stands in relation to growing space. 83 pp. illus. (Harvard Forest bulletin 13.) Petersham, Mass., 1929.
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- Grasovskiy, Amihud: Some aspects of light in the forest. 53 pp. illus. (Yale Forest School bulletin no. 23.) New Haven, 1929.
- Haig, I. T.: Colloidal content and related soil factors as indicators of site quality. 33 pp. (Yale Forest School bulletin no. 24.) New Haven, 1929.
- Hawley, R. C.: The practice of silviculture. 2nd ed. 335 pp. illus. J. Wiley & Sons, Inc., New York, 1929.
- Hitchcock, J. A.: Economics of the farm manufacture of maple syrup and sugar, parts 1-2. (Vermont Agricultural Experiment Station bulletins 285-286.) Burlington, 1928.
- Hoyle, R. J.: Wood-using industries of New York. rev. ed. 160 pp. illus. (New York State College of Forestry technical publication no. 27.) Syracuse, 1928.
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- Maryland Department of Forestry: Report for the fiscal year 1928. 47 pp. illus. Baltimore, 1929.
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- Oregon State Board of Forestry: Eighteenth annual report of the State forester, 1928. 35 pp. Salem, 1929.
- Peavy, G. W.: Oregon's commercial forests, rev. edition. 94 pp. illus. (Oregon State Board of Forestry bulletin 2, rev.) Salem, 1929.

Smith, J. Russell: Tree crops: a permanent agriculture. 333 pp. illus., maps. Harcourt, Brace, & Co., New York, 1929.

Spaulding, P.: White-pine blister rust; a comparison of European with North American conditions. 59 pp. illus., maps. (U. S. Department of Agriculture technical bulletin no. 87.) Washington, D. C., 1929.

United States National Committee on Wood Utilization: Survey of nonutilized wood in Virginia. 60 pp. illus., map. Washington, D. C., 1929.

## Articles in Periodicals

Annals of the American Academy of Political and Social Science, March, 1929.—Forestry and the agricultural crisis, by Raphael Zon, pp. 70-76.

Northwest Science, March, 1929.—National forests: their part in State development, by J. D. Guthrie, pp. 23-26.

Paper Mill and Wood Pulp News, March 16, 1929.—Future possibilities in the utilization of cellulose, by C. H. Herty, pp. 22, 24-26, 34.

Paper Trade Journal, January 17, 1929.—Utilization of hardwoods for pulp and paper, by C. E. Curran, pp. 66-71.

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Zeitschrift für Forst-und Jagdwesen, January, 1929.—Zur frage der forstpflanzenzuchtung, by A. Kamlah and H. Kamlah, pp. 31-39.

## Recent Publications of the Forest Service

Farmers' Bulletin 1492, Arbor Day (reprint).

Miscellaneous Publication 45, Forestry Clubs for Young People.

Program for Observing Forest Week.

Needs and Development of the Nation's Forestry Program.

National Forest Map Folders: Pend Oreille, Gallatin, Nebraska, Cochetopa.

National Forest Administrative Maps: 1-inch, Wichita (in three colors); ½-inch, Helena, Missoula, Coeur d'Alene; ¼-inch, Lewis & Clark, Helena, Missoula.